CLASS 414, MATERIAL OR ARTICLE HANDLING

SECTION I - CLASS DEFINITION

Apparatus, device, implement or method for placing or displacing particular articles in a particular manner or with reference to a particular support, for loading or unloading vehicles with materials or objects in general, charging or discharging furnaces, bins, chambers, or other receptacles, stacking or piling articles or materials, also combinations of general types of carriers or forwarding mechanisms, which types, per se, are separately classified elsewhere, and general types of elevators, cranes, or hoists when associated with special means for handling the load to place it on the carrier or remove it therefrom.

(1) Note. The miscellaneous subclass of this class is designed to receive any material-moving mechanism for which no place has been established elsewhere.

(2) Note. The term "handling" in the title is intended to indicate in a general way those more or less complex and intricate movements, imparted to matter by instruments or mechanisms which are deemed analogous to nonshaping manipulations, or the varying movements imparted to matter or objects by hand.

(3) Note. Treatment of matter to change its shape or condition is not included in this class. As fabricating and material-conditioning apparatus have commonly associated with them means for bringing the material to the shaping or conditioning instrumentalities or carrying it therefrom, combinations of handling or conveying means with fabricating, shaping, or conditioning means are classified on the basis of the latter.

(4) Note. Earthworking in general effects a change in the shape or form of matter and is classified on that basis; but the removing of earth by power scoops, shovels, and the like, which operate in the same manner whether removing a pile of loose coal or grain or the loose earth from an excavation, are classified on the basis of handling in this or other material-moving or transportation classes. Otherwise stated, those inventions relating to the excavating art, including power scoops, shovels or the like in which movement is imparted to such scoops or shovels subsequent to or in addition to those movements deemed necessary to complete an excavating operation, which additional movement is usually for transporting the excavated material to a disposal point, are considered to include such handling of the excavated material as will provide a basis for classification in this class (414). Even the teeth of scoops, commonly placed there for excavating hard earth, may be broadly claimed in combination with a handling-machine otherwise falling into this class without excluding the patent from this class, although the specific teeth if claimed particularly, would go to a class of excavating or earthworking.

(5) Note. The separation of mixed solid materials by an operation depending on differences of size, form, mass, or other physical properties of the mixed materials or objects is deemed to be a highly special form of moving or handling materials, and the classes of separating are deemed superior to this class.

(6) Note. Regarding land or water vehicles supporting other load-handling devices, the vehicle is deemed to be a mechanism unless the handling mechanism is so combined with and related to the vehicle as to load or unload that vehicle or handle its load or cargo.

(7) Note. For a thorough search in material-handling, all subclasses found in the index indicating by title a fabrication or material-treating class, with feeding, conveying, or other handling means, should be inspected.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

Combined conveyors, carriers, and forwarders of types now included under Class 198, Conveyors: Power-Driven, are to be found in Class 198; but combined carriers, the separate elements of which are in different classes, are provided for in this class.

Vehicles in which the body is merely moved or tilted to

dump by gravity are classified in Class 298 or in Class 105, particularly, subclasses 238.1+; however, in regard to Class 298, see also the reference thereto in subclass 469 of this class (414).

For handling where manipulation during the progress of manual work is involved or for handling including the engagement of more than one part to aid in manual assembly of such parts, see Class 269, Work Holders. The fact that the article handled is assembled manually with an abutting receiver will not exclude a handling mechanism from Class 414.

VEHICLE LOADING AND UNLOADING

This class has numerous subclasses devoted to the loading and unloading of vehicles of various types; for examples see Subclass References to the Current Class, below. For vehicles charging and discharging in other classes, see References to Other Classes below

EXCAVATING AND LOADING MACHINES

For excavating and loading machines of the type having a scoop or rake delivering to an endless or rotary carrier, see "SEARCH CLASS" below in References to Other Classes below

GENERAL TRANSPORTATION AND MATERIAL HANDLING

See References to Other Classes below.

SIMPLE HANDLING OF CERTAIN CLASSES OF MATERIAL IN A SPECIAL MANNER

See References to Other Classes below.

MEANS CONTROLLING FLOW

See References to Other Classes below.

SECTION III - SUBCLASS REFERENCES TO THE CURRENT CLASS

SEE OR SEARCH THIS CLASS, SUBCLASS:

137.1+, 140.1, 333-402, 434+, 467+ for loading and unloading of vehicles of various types.

SECTION IV - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

4, Baths, Closets, Sinks, and Spittoons, (Means Controlling Flow.)

5, Beds, subclasses 81.1 and 83.1+.

15, Brushing, Scrubbing, and General Cleaning, subclasses 78+.

37, Excavating, subclasses 304+ for self-loading vehicles. (Vehicle Loading and Unloading.)

37, Excavating, appropriate subclasses. (Excavating and Loading Machines.)

37, Excavating, subclasses 394+ for devices comprising a scoop and drag line to fill the same.

56, Harvesters, (Vehicle Loading and Unloading.)

56, Harvesters, subclass 345. (Excavating and Loading Machines.)

56, Harvesters, subclasses 344+.

99, Foods and Beverages: Apparatus, for a conveyor designed for the reception of a food article, or a food or beverage containing receptacle when combined with a heat generator, a heat exchanger, other means for treating material operative during the conveying, or an enclosure or tank where the structure thereof is in excess of that necessary for the operation of the conveyor; subclasses 360+ for a conveyor to transport a fluid filled receptacle to and from a heat treatment.

100, Presses, appropriate subclasses for presses which may, when used on a vehicle, inherently function to load or unload the vehicle. (See class definition, Lines With Other Classes and Within This Class, Binding and Pressing Elsewhere Classified, in Class 100). (Vehicle Loading and Unloading.)

104, Railways, subclasses 18+ for load transfer to or from moving trains; if external means is involved, see subclasses 334+, 337 and 338 of this class (414). (Vehicle Loading and Unloading.)

104, Railways, (General Transportation and Material Handling.)

105, Railway Rolling Stock, subclasses 239+ for dumping car bodies. (Vehicle Loading and Unloading.)

105, Railway Rolling Stock, (General Transportation and Material Handling.)

110, Furnaces, subclasses 101+ and 165+.

114, Ships, subclasses 27+ for dumping and unloading scows, and subclasses 183+ for bilge discharge. (Vehicle Loading and Unloading.)

114, Ships, subclasses 365+ for miscellaneous apparatus for handling life craft (e.g., aboard ships), and also analogous apparatus located on

docks and seawalls. (General Transportation and Material Handling.)

137, Fluid Handling, for fluid handling not elsewhere provided for. (General Transportation and Material Handling.)

137, Fluid Handling, (Means Controlling Flow.)

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, for fluent material handling with receiver or receiver coacting means.

169, Fire Extinguishers, (Means Controlling Flow.)

171, Unearthing Plants or Buried Objects, particularly subclasses 31, 60+, 63+ 89, 101, 110, 111+, and 138. (Excavating and Loading Machines.)

173, Tool Driving or Impacting, appropriate subclasses for a means of general utility for driving or impacting a tool, particularly subclasses 197+, and see the search notes therein for such means including a work cleansing feature.

180, Motor Vehicles, (General Transportation and Material Handling.)

182, Fire Escape, Ladder, or Scaffold, subclass 1 for horizontal step on pivoted ladder; subclass 2.1 for horizontal platform on pivoted booms; subclasses 10+ for carrier traveling along an inclined cable; subclasses 12+ for horizontally traveling personnel supports with means to control or actuate said traveling; subclasses 36+ for personnel supports traversing the horizontal and riding on a track; subclasses 42+ for personnel carriers mounted on an endless conveyor; subclasses 48+ for chutes or towers for personnel use; subclasses 101+ for a vertically moving platform combined with a ladder; and subclasses 141+ for platforms combined with elevating or lowering means.

184, Lubrication, (Means Controlling Flow.)

186, Merchandising, for merchandising.

187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, (General Transportation and Material Handling.)

198, Conveyors: Power-Driven, (General Transportation and Material Handling.)

204, Chemistry: Electrical and Wave Energy, subclasses 198 through 226 for electrode handling means specialized for electrolytic processes.

211, Supports: Racks, for racks not elsewhere provide for.

212, Traversing Hoists, (General Transportation and Material Handling.)

221, Article Dispensing, subclass 185 for ambulant article dispensing devices including vehicular types. (Vehicle Loading and Unloading.)

222, Dispensing, subclasses 608+ for vehicular types. (Vehicle Loading and Unloading.)

224, Package and Article Carriers, (General Transportation and Material Handling.)

226, Advancing Material of Indeterminate Length, appropriate subclasses for methods of, and apparatus for, feeding material without utilizing the leading or trailing ends to effect movement of the material. (Simple Handling of Certain Classes of Material in a Special Manner.)

232, Deposit and Collection Receptacles, for deposit and collection receptacles.

239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 650+ for scattering nonfluid material from a container. (Vehicle Loading and Unloading.)

241, Solid Material Comminution or Disintegration, appropriate subclasses for material handling claimed in combination with significant comminution. See Section 9 of the class definition of Class 241 for a general statement of the line.

242, Winding, Tensioning, or Guiding, (Simple Handling of Certain Classes of Material in a Special Manner.)

244, Aeronautics, particularly subclass 136, 137.1, and 140+. (Vehicle Loading and Unloading.)

244, Aeronautics and Astronautics, (General Transportation and Material Handling.)

251, Valves and Valve Actuation, (Means Controlling Flow.)

254, Implements or Apparatus for Applying Pushing or Pulling Force, (General Transportation and Material Handling.)

258, Railway Mail Delivery, (Vehicle Loading and Unloading.)

271, Sheet Feeding or Delivering, (Simple Handling of Certain Classes of Material in a Special Manner.)

280, Land Vehicles, (General Transportation and Material Handling.)

291, Track Sanders, (Vehicle Loading and Unloading.)

294, Handling: Hand and Hoist-Line Implements, for hand and hoist-line implements.

296, Land Vehicles: Bodies and Tops, subclasses 1.1+ for bodies, and 50+ for end gates.

296, Land Vehicles: Bodies and Tops, (General Transportation and Material Handling.)

298, Land Vehicles, Dumping, (Vehicle Loading and Unloading.)

298, Land Vehicles: Dumping, (General Transportation and Material Handling.)

299, Mining or In Situ Disintegration of Hard Material, subclasses 64+ and see the search notes therein for mining or hard material disintegrating combined with material handling. (Excavating and Loading Machines.)

300, Brush, Broom, and Mop Making, subclass 18.

312, Supports: Cabinet Structure, subclasses 35+.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, (General Transportation and Material Handling.)

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 260+ for nuclear reactors including the handling of nuclear reactor components, particularly the nuclear fuel, but see also subclass 146 of this class (414). (Simple Handling of Certain Classes of Material in a Special Manner.)

406, Conveyors: Fluid Current, subclasses 39+ for vehicle mounted fluid current conveyors. (Vehicle Loading and Unloading.)

406, Conveyors: Fluid Current, (General Transportation and Material Handling.)

417, Pumps, (Means Controlling Flow.)

418, Rotary Expansible Chamber Devices, (Means Controlling Flow.)

441, Buoys, Rafts, and Aquatic Devices, (General Transportation and Material Handling.)

446, Amusement Devices: Toys, subclass 428 for a toy vehicle having a tiltable receptacle for discharging its contents (e.g., dump truck). (Vehicle Loading and Unloading.)

452, Butchering, subclasses 177+ for handling devices used in butchering operations.

453, Coin Handling, for pertinent subclass(es) as determined by schedule review.

454, Ventilation, (Means Controlling Flow.)

470, Threaded, Headed Fastener, or Washer Making: Process and Apparatus, subclasses 164+ and see the notes thereto for feeding of blanks of stock material in the form of strips and rods, not otherwise specifically provided for, to (1) manufacturing machines, or (2) sorting or orienting devices. Included is the feeding of strip or rod type blanks or stock material for other than bolts, nails, nuts, screws, rivets, and washers, when such blanks or stock material are substantially uniform in cross section. (Simple Handling of Certain Classes of Material in a Special Manner.)

472, Amusement Devices, particularly subclasses 1+ for an amusement roundabout which may carry a person or object along a circuitous path and subclass 2 for an amusement round about combined with elevator type structure.

483, Tool Changing, generally for a process or apparatus including a tool transfer means combined with either a tool support or storage means and particularly subclasses 58+ for a tool transfer means combined with a tool storage means.

623, Prosthesis (i.e., Artificial Body Members), Parts Thereof, or Aids and Accessories Therefor, subclasses 57+ for artificial body members with remote control. (Vehicle Loading and Unloading.)

SUBCLASSES

1 ARTICLE MANIPULATOR MOVES ANALOGOUS WITH HUMAN HAND, FINGER, OR ARM MOVEMENT:

This subclass is indented under the class definition. Apparatus having article supporting and moving means which is adapted to move said article in response to and in direct proportion to the movement in any direction of a means engaged and freely moved by a person's arm, finger, or hand, through a motion transmission means interconnecting the article supporting means and the arm, finger, or hand engaging means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

217, and 218, for article holding receivers attached to a finger or to the metacarpal portion of a hand, respectively.

SEE OR SEARCH CLASS:

30, Cutlery, subclasses 232, 291, 298, and 323 for cutting implements combined with hand or finger-attaching devices.

34, Drying and Gas or Vapor Contact With Solids, subclass 95.2 for a hand-attachable blotting device.

131, Tobacco, subclass 258 for finger rings having cigar and cigarette supports.

248, Supports, subclasses 118.1+ for a hand-attachable support for a writer.

401, Coating Implements With Material Supply, subclasses 7 and 8 for a coating implement including, respectively, a pocket or loop (e.g., strap) for attachment to a hand or part thereof (e.g., finger).

623, Prosthesis (i.e., Artificial Body Members), Parts Thereof, or Aids and Accessories Therefor, subclasses 57+ for artificial body members with remote control.

700, Data Processing: Generic Control Systems or Specific Applications, subclasses 245 through 264 for robot arm control.

2 Motion of hand, finger, or arm member multiplied or reduced in its transmission to article manipulator means:

This subclass is indented under subclass 1. Apparatus having means whereby the ratio of the motion imparted to the article-supporting means is other than one to one relative to the motion imparted to the means engaged by a person's arm, finger, or hand.

3 Having means to transmit motion through an imperforate barrier:

This subclass is indented under subclass 1. Apparatus wherein the motion transmission means between the article-supporting and moving means and the arm, finger, or hand engaging means comprises magnetic or other nonsolid conductor energy transmitting means.

4 Electric or fluid motor drive for manipulator:

This subclass is indented under subclass 1. Apparatus wherein the means transmitting motion between the article-supporting and moving means and the arm, finger, or hand engaging means, comprises a pressurized fluid motor means or an electrically actuated motor means.

5 Having means to transmit feedback signal from manipulator means to hand, finger, or arm:

This subclass is indented under subclass 4. Apparatus having means which is a part of, a function of, or is in addition to the fluid or electrically actuated motor means by which the position, motion, or force of the article-supporting and moving means is transmitted or otherwise communicated back to the person actuating the arm, finger, or hand engaging means.

6 For grip force amplification:

This subclass is indented under subclass 4. Apparatus wherein the means Actuating the article supporting and moving means is specifically designed to multiply by some factor the force exerted on the article over that force imputed by the arm, finger, or hand.

7 Having flexible motion transmission means:

This subclass is indented under subclass 1. Apparatus wherein the motion transmission means includes a cable, chain, belt, or other means adapted to flex or bend between its extremities.

8 Having sealing or radiation shielding means:

This subclass is indented under subclass 1. Apparatus having means associated therewith to impede the flow of radiant energy.

9 HUMAN BODY OPERATED EATING AID:

This subclass is indented under the class definition. Apparatus having means to transfer material into or in the proximity of a person's mouth in response to and as the result of the movement of a part of said person's body.

SEE OR SEARCH THIS CLASS, SUBCLASS:

1+, for article manipulators which move analogous with the human hand, finger, or arm movements.

680+, for vertically swinging load supports.

10 APPARATUS FOR MOVING MATERIAL TO A POSITION IN THE ERECTION OR REPAIR OF A BUILDING:

This subclass is indented under the class definition. Apparatus having means to reorient or reposition a unit of building material to a location where it may be secured in place on a building site, said means being capable of holding or supporting said unit in a given position while being so secured.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), subclasses 122.1+ for building components having installed means for raising or lowering said components.

187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, subclass 900 for a temporary construction elevator for lifting building material during the erection of a building.

11 Flat wall or ceiling member manipulating means:

This subclass is indented under subclass 10. Apparatus wherein the means is designed to reorient or reposition a unit of material having a flat surface and which, when secured in place, will form a part or all of the wall or ceiling portion of a building.

(1) Note. Apparatus to move and support a door in place while being hung is not included in this definition, but is found above in subclass 10.

SEE OR SEARCH CLASS:

254, Implements or Apparatus for Applying Pushing or Pulling Force, appropriate subclasses for lifting apparatus, per se.

12 Boxlike building module manipulating means:

This subclass is indented under subclass 10. Apparatus wherein the means is designed to reorient or reposition a building module and support the same while being secured in place at a building site.

SEE OR SEARCH THIS CLASS, SUBCLASS:

373+, for roadway vehicles and means cooperable therewith to load or unload said vehicle.

SEE OR SEARCH CLASS:

238, Railways: Surface Track, subclass 13 for rail mounted house moving means.

13 LAUNDRY HANDLING DEVICE:

This subclass is indented under the class definition. Apparatus having means to specifically manipulate articles, bundles of articles, or groups of articles which are in the nature of fabric or other flexible material sheets, apparel, etc., from one place to another either prior to or subsequent to a laundering operation on said articles.

14 STOCK PULLING OR PUSHING:

This subclass is indented under the class definition. Apparatus for advancing or feeding elongated work relative to a device to treat or modify the work (e.g., lathe, puncher, etc.) by means which either (a) engages the work at its forward portion and draws it into position, or (b) contacts it at the rear surface and shoves it into position.

(1) Note. The feeding means can be mounted on the tool turret of a manufacturing machine.

(2) Note. The work may be delivered to a work holder (e.g., a chuck) which may be part of a work modifying means (e.g., a lathe or punch) and the work holder may be operated to grasp or clamp the work, provided that no more of the work modifying means is claimed than that necessary to receive and retain the work. Means to start and stop the work modifying means or to move the work holder (a) during a step in which actual work modification occurs, or (b) in a direction other than a feeding direction are therefore excluded; such means claimed in combination with stock pushing or pulling means are also excluded. For example, a nominally claimed means to rotate a chuck or to start or stop a lathe would be excluded and classified in the appropriate work modifying class; a means to start or stop the work feeding or remnant ejecting means, per se, is proper subject matter for this subclass.

SEE OR SEARCH CLASS:

29, Metal Working, appropriate subclasses for devices for pushing or pulling metal stock having claimed in combination therewith a tool for working on the stock, or means producing a special motion of the stock for facilitating metal working.

82, Turning, subclasses 124+ for devices for pushing or pulling a workpiece to or from a lathe combined with means for effecting a relative rotation between the workpiece and the cutting element of the lathe.

83, Cutting, appropriate subclasses for devices for pushing or pulling a workpiece having in combination therewith means to sever of cut off the work to predetermined lengths.

144, Woodworking, subclass 245 for feeding a wood workpiece to a cutter of the type provided in Class 144.

198, Conveyors: Power-Driven, subclasses 736+ for article transfer by a reciprocating pusher.

221, Article Dispensing, appropriate subclasses for article dispensing or feeding devices not otherwise provided for, and especially feeding devices combined with means for separating one or more articles from a stack which is comprised of more articles than are fed in any one feeding operation.

226, Advancing Material of Indeterminate Length, appropriate subclasses for methods of and apparatus for feeding running and indefinite lengths of stock or work, without utilizing the leading or trailing end to effect the feeding motion. See search notes in Class 226 for references to other feeding classes.

271, Sheet Feeding or Delivering, appropriate subclasses for feeding of flexible sheets, especially feeding from a stack or to a receiver, predicated upon the flexible nature of the sheets.

470, Threaded, Headed Fastener, or Washer Making: Process and Apparatus, subclasses 164+ for feeding of work blanks or stock pieces specialized to the purpose of Class 470, or claimed in nominal combination with such machines.

15 With means ejecting stock remnant:
This subclass is indented under subclass 14. Apparatus having means to positively discharge from the work handling device that portion of the stock which is too small to be fed to the work tool (e.g., cutter, puncher, etc.) for modification into a complete product unit.

16 With additional diverse motion of stock:
This subclass is indented under subclass 14. Apparatus in which work which is pulled or pushed in one general feeding direction is additionally moved in a different direction relative to a disclosed tool which is maintained in non-work contacting position while the work is moving.

(1) Note. The additional motion may or may not be simultaneous with the motion in the general feeding direction.

(2) Note. Feeding of the work in any manner into engagement with the tool to perform an art operation (e.g., punching, scoring) on the work is excluded.

17 With fluid pressure actuated pushing or pulling means:
This subclass is indented under subclass 14. Apparatus employing a motor surface which is moved by the force of a confined gas or liquid.

18 Stock end face pushers:
This subclass is indented under subclass 14. Apparatus in which the work is contacted at a surface which faces in a direction opposite to that in which the work is to be moved and is shoved into position.

19 For sheet stock:
This subclass is indented under subclass 18. Apparatus in which the work is comprised of a single element, or a stack of single elements, each element being extremely thin in relation to its length and breadth.

(1) Note. The individual elements in a stack must be held together only by the forces of gravity and friction. For example, devices for pushing blocks comprised of laminated sheets, each joined to the adjacent sheet by means of an adhesive, would be classified in subclass 18 above.

20 Sheet stock lead end pullers:
This subclass is indented under subclass 14. Apparatus for engaging the work at its forward portion and drawing it into position for subsequent contact by a tool, said work being comprised of a single element, or a stack of single elements, each element being extremely thin in relation to its length and breadth.

(1) Note. See (1) Note to subclass 19 above.

21 WITH WEIGHING:
This subclass is indented under the class definition. Material-handling devices including a weighing feature wherein there is some moving of the material besides that necessary or incidental to the weighing operation.

SEE OR SEARCH CLASS:
177, Weighing Scales, subclasses 52+ for means conveying and weighing successive receivers, subclasses 145+ for a weigher with loading or unloading means involving no modification of the material-handling structure other than for the purpose of weighing, and subclasses 161+ for a weigher combined with means for guiding the load onto the weigher.
212, Traversing Hoists, subclasses 276+ for weight-responsive crane control systems and subclass 283 for cranes having a weight indicator

22.51 WELL PIPE OR ROD RACKING MECHANISM:
This subclass is indented under the class definition. Apparatus for moving a cylindrical member in the form of a pipe or rod from or to racked or storage position over a well.

(1) Note. The device classified here are normally used in connection with the assembling or disassembling of strings of pipes or rods in well working operations.

(2) Note. A stabber or a hoist is included herein if it could be used to move a pipe or rod to or from a rack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
23, for an apparatus for handling a pole or tree between prone and upright positions.
24, for an apparatus for lowering glass cylinders from an upright position.
745.2, for apparatus for moving or manipulating an elongated vertically oriented cylindrical bar, generally.

SEE OR SEARCH CLASS:
175, Boring or Penetrating the Earth, subclass 85 for an earth boring means combined with orienting or racking means for unconnected tools or sections of shaft or casing.
211, Supports: Racks, subclass 60.1 for pipe or tube racks, per se.

22.52 With slope change:
This subclass is indented under subclass 22.51. Apparatus wherein the inclination of the cylindrical member is intentionally changed during manipulation thereof.

(1) Note. Moving pipe from a horizontal rack on the ground is included herein if the inclination of the pipe is changed during transport.

22.53 For nonvertical drilling:
This subclass is indented under subclass 22.52. Apparatus wherein inclination of the cylindrical member is changed to establish drilling direction other than toward the center of the earth.

22.54 Horizontal to/from vertical:
This subclass is indented under subclass 22.52. Apparatus wherein the cylindrical member is moved all the way from level with to normal to the horizon or vice versa.

22.55 Boom pivoting about horizontal axis:
This subclass is indented under subclass 22.54. Apparatus including structure engaging the cylindrical member and swinging therewith about an axis extending in the horizontal direction to move the member from the level to the vertical position or vice versa.

22.56 Pivoting derrick:
This subclass is indented under subclass 22.55. Apparatus including a support structure which is intended to support the cylindrical member in a well, wherein the entire support structure is moved about an axis extending in the horizontal direction to move the member from the level to the vertical position or vice versa.

22.57 Guided skate or pusher:
This subclass is indented under subclass 22.54. Apparatus including support structure for controlling movement of the cylindrical member generally axially thereof and including (a) a carriage riding along the controlling structure and carrying the weight of one end of the member, or (b) a means riding along the controlling structure and engaging the end of the member and urge that member axially along the controlling structure.

22.58 Pipe or rod guide:
This subclass is indented under subclass 22.54. Apparatus including support structure for controlling movement of the cylindrical member generally axially thereof, which structure is troughlike to guide the member as it slides therealong.

22.59 Guided skate or pusher:
This subclass is indented under subclass 22.52. Apparatus including support structure for controlling movement of the cylindrical member generally axially thereof and including (a) a carriage riding along the controlling structure and carrying the weight of one end of the member, or (b) a means riding along the controlling structure and engaging the end of the member and urge that member axially along the controlling structure.

22.61 Pipe or rod guide:
This subclass is indented under subclass 22.52. Apparatus including support structure for controlling movement of the cylindrical member generally axially thereof, which structure is troughlike to guide the member as it slides therealong.

22.62 Horizontal rack:
This subclass is indented under subclass 22.51. Apparatus comprising means for moving a cylindrical member from or to racked or storage position with the axis thereof extending in a direction parallel with the horizon.

22.63 Vertical rack:
This subclass is indented under subclass 22.51. Apparatus comprising means for moving a cylindrical member from or to a racked or storage position with the axis thereof extending in a direction toward the center of the earth.

22.64 Compensating for support shift (e.g., ship roll, etc.):
This subclass is indented under subclass 22.63. Apparatus including provision to maintain support of the cylindrical member in a vertical direction in spite of movement of the surface on which the apparatus is supported.

(1) Note. Included herein is apparatus to compensate for the movement of a ship under wave or tide action, or a device to compensate for vibration or earth tremor.

22.65 Pivotal carriage:
This subclass is indented under subclass 22.63. Apparatus wherein the means to move the cylindrical member is supported to turn about a fixed axis.

22.66 Carousel:
This subclass is indented under subclass 22.65. Apparatus wherein the means to move the cylindrical member includes plural circumferentially spaced supports for distinct members to be supported.

22.67 Pivotal derrick:
This subclass is indented under subclass 22.65. Apparatus wherein the means to move the cylindrical member comprises the main support assembly.

(1) Note. The apparatus of this subclass may comprise a derrick that pivots at the ground to move the pipe or rod, or one that pivots near its peak to effect such movement.

22.68 With laterally guided pipe or rod support:
This subclass is indented under subclass 22.63. Apparatus wherein the means to move supports the cylindrical member against gravity and is controlled to move along a fixed path.

22.69 On inclined derrick mounted track:
This subclass is indented under subclass 22.68. Apparatus wherein the supporting and moving means travels on a rail-like device which is fixed to the main support structure and is neither vertical nor horizontal.

22.71 Both upper and lower pipe or rod holding and guiding means:
This subclass is indented under subclass 22.68. Apparatus including a first means for grippingly engaging, supporting and moving the cylindrical member at one location along the axis of the cylindrical member and a second means for grippingly engaging and moving the cylindrical member at a different location therealong.

23 POLE OR TREE HANDLERS:
This subclass is indented under the class definition. Devices for raising or lowering telegraph or like poles to or from standing position or for removing, transplanting, or setting trees in the operation of transplanting.

SEE OR SEARCH CLASS:
212, Traversing Hoists, subclasses 242+, 251+, and 259+ for traversing hoists having a swinging boom and a specific engager for the load; and subclasses 343+ for ambulant traversing hoists and subclass 901, a collection of cross-referenced patents, for ambulant dolly-type hoists or cranes
280, Land Vehicles, appropriate subclasses for trucks adapted to be used to transport trees or poles.

24 GLASS CYLINDERS:
This subclass is indented under the class definition. Mechanism for handling or taking down glass cylinders either during or after the completion of the drawing process.

24.5 ROUND HAY BALE HANDLING:
This subclass is indented under the class definition. Devices for working on or with a circular bale of hay, the bale normally being a ribbon or layer of hay wound to form a compact coil.

24.6 Unrolling:
This subclass is indented under subclass 24.5. Devices for unwinding a coil of hay.

25 HAY DISTRIBUTORS:
This subclass is indented under the class definition. Devices deemed to be particularly adapted for distributing hay or similar material in mows or on stacks and involving more than a mere chute.

26 TOBACCO STRINGERS OR UNSTRINGERS:
This subclass is indented under the class definition. Apparatus for piling or arranging devices for use in stringing tobacco leaves or hands upon sticks, hangers or other handling devices, or for unstringing tobacco therefrom.

SEE OR SEARCH CLASS:
56, Harvesters, subclass 27.5 for such devices combined with harvesting apparatus.
294, Handling: Hand and Hoist-Line Implements, subclass 5.5 for tobacco sticks and hangers.

27 APPARATUS FOR STRINGING ARTICLES ON A SUPPORT IN ABUTTING RELATION:
This subclass is indented under the class definition. Apparatus wherein articles are strung in abutting relation on a supporting means to form a group, e.g., impaling articles on a spike or placing washer-shaped articles on a peg.

SEE OR SEARCH THIS CLASS, SUBCLASS:
798.2+, for means placing articles in mutually sustaining relation in a horizontally extending row.
798.9, for means for removing one or more articles from a row of mutually sustaining articles.
908, and 911, for handling perforated articles and rolls, respectively.

111 VEHICLE-CARRIED BALE ACCUMULATOR:
This subclass is indented under the class definition. Apparatus having means whereby bales are accumulated on a vehicle in a substantially horizontally extending row.

SEE OR SEARCH THIS CLASS, SUBCLASS:
789.7, for discharging a superposed group of bales from a bale accumulator.

SEE OR SEARCH CLASS:
56, Harvesters, subclasses 474+ for a carrier in combination with a harvester.

132 HAY STACK SHAPERS:

This subclass is indented under the class definition. Piling devices for building stacks of hay and the like and usually consisting of a rack or frame and a hoist or other conveying means which deposits the material therein or arranges it thereon.

SEE OR SEARCH CLASS:

221, Article Dispensing, subclasses 175+ for article dispensers not otherwise provided for, provided with stack forming means.

460, Threshing, subclass 905 for racks or frames merely, involving no moving or conveying means, upon which stacks may be built.

133 COAL STORAGE TYPE:

This subclass is indented under the class definition. Apparatus comprising a storage floor, base, or other carrier upon which coal or similar material may be arranged in a pile, and handling means to place said material on said pile or to remove said material from said pile.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclasses 506+ and 632+ and other subclasses for conveyors, under the definition of Class 198, or conveyor systems, likewise classified, which are specialized for collecting a load from a static support.

137.1 MARINE LOADING OR UNLOADING SYSTEM:

This subclass is indented under the class definition. Apparatus for charging or discharging a buoyant vehicle characterized by some peculiarity due to the fact that the vehicle floats on or in water.

SEE OR SEARCH THIS CLASS, SUBCLASS:

803, for a process of loading or unloading a marine system.

SEE OR SEARCH CLASS:

14, Bridges, subclasses 2.4+ for the combination of a land vehicle with a bridge carried thereby, which land vehicle is to remain with the bridge as support structure therefor; and subclasses 71.1+ for a gangway, generally, including a gangway attached to a marine vessel. However, a bridge or gangway for use with a buoyant vehicle including means to effect movement of cargo thereon (e.g., a windlass) or means ancillary to loading or unloading (e.g., an elevator for lifting cargo from a land vehicle that has boarded a buoyant vehicle) is to be found in Class 414, in this subclass and the subclasses indented hereunder.

37, Excavating, subclasses 394+ for a dragline scraper, generally, including a dragline scraper for digging from the earth combined with material handling means for loading a buoyant vehicle. However, a dragline scraper digging from the hold of a buoyant vehicle combined with material handling means for unloading that vehicle will be found in Class 414, in this subclass and subclasses indented hereunder.

104, Railways, especially subclass 114 for a railway for transporting material from one ship to another, including a cableway; not including any provision to on- or off-load the material from a ship.

105, Railway Rolling Stock, especially subclasses 1.1 through 9 for a railway vehicle with or without a railway, not including any provision to on-or off-load material to or from a ship.

114, Ships, for the combination of a significantly recited buoyant vehicle with material handling structure, generally, unless such combination is specifically provided for elsewhere, e.g., a buoyant vehicle combined with means to load or unload that vehicle is provided for in Class 414, in this subclass and the subclasses indented hereunder. A buoyant vehicle combined with a bridge or gangway and additional material handling structure to effect movement of cargo (e.g., a windlass) or which is ancillary to loading or unloading (e.g., an elevator for lifting cargo from a land vehicle that has boarded a buoyant vehicle) is

to be found in Class 414, in this subclass and the subclasses indented hereunder. Search subclasses 27+ of Class 114, for a scow (or barge or "buoyant vehicle") intended to be loaded or unloaded by dumping its cargo into the water. Dumping of Class 114 may comprise use of a door in the bottom of the scow. The combination of a scow with a conveyor to transport the cargo over the side of the scow, or with means to bodily lift the scow and dump it into the water is to be found in Class 414 in this subclass and the subclasses indented hereunder. Furthermore, the combination of a scow with means to load and with means to dump the scow is to be found in Class 414,in this subclass and the subclasses indented hereunder. Search subclasses 258+ of Class 114, for a "mother" buoyant vehicle combined with specific means to lift a "daughter" craft to or from the water. Search subclasses 264+ of Class 114, for a free floating platform (i.e., structure having provision for buoyancy) generally. A free floating platform with means to load or unload other marine structure is to be found in Class 414, in this subclass and the subclasses indented hereunder. Search subclass 362 of Class 114, for boarding aides, including a ladder or gangway, generally limited to use for loading or unloading personnel onto or off of a marine vessel. Search subclasses 365+ of Class 114 for means to lift a life boat to or from the water.

137, Fluid Handling, subclass 899.2 for the combination of a buoyant vehicle with means to convey fluid material from one location to another thereon.

141, Fluent Material Handling With Receiver or Receiver Coacting Means, for the combination of a buoyant vehicle with means to convey fluent material to or from to load or unload that vehicle.

166, Wells, subclasses 335+ for submerged well structure, generally, and for such well structure combined with means to load or unload a buoyant vehicle.

198, Conveyors: Power-Driven, for a powered conveyor, generally. The combination of a conveyor with provision to load or unload a buoyant vehicle is to be found in Class 414, in this subclass and the subclasses indented hereunder.

212, Traversing Hoists, subclasses 307+ for a floating traversing hoist, generally. The combination of a floating traversing hoist with provision to load or unload a buoyant vehicle, e.g., with means attaching a portion of the hoist to an adjacent vehicle, is to be found in Class 414, in this subclass and the subclasses indented hereunder.

254, Implements or Apparatus for Applying Pushing or Pulling Force, especially subclasses 264+ for structure for applying force directly to an object to move it onto or off a buoyant vehicle, without additional material handling provision.

405, Hydraulic and Earth Engineering, subclasses 1+ for buoyant vehicle portage, launching or removing, generally; and subclasses 195.1+ for a floating dock, i.e., a floating platform attached to land, generally.

406, Conveyors: Fluid Current, for means to transport generally particulate material in a fluid medium, generally, and for the combination of such transport means with a buoyant vehicle, including provision to load or unload that vehicle.

137.2 Loading or unloading aircraft under marine conditions:

This subclass is indented under subclass 137.1. Apparatus for charging or discharging a flying vehicle while that vehicle floats on or in water.

SEE OR SEARCH THIS CLASS, SUBCLASS:

137.6, for apparatus for loading a buoyant vehicle from an vehicle supported by the atmosphere.

137.3 Underwater loading or unloading:

This subclass is indented under subclass 137.2. Apparatus for charging or discharging the flying vehicle through an opening therein that is

entirely beneath the surface of the water on or in which the vehicle floats.

137.4 With weather cover:
This subclass is indented under subclass 137.1. Apparatus having means to protect part or all thereof against the elements of the atmosphere.

137.5 Marine vessel to/from well:
This subclass is indented under subclass 137.1. Apparatus particularly adapted to load or unload a buoyant vehicle from a tubular casing extending into the earth for passage of in situ minerals therethrough, including loading or unloading the component parts of the tubular casing.

137.6 Marine vessel to/from air vessel:
This subclass is indented under subclass 137.1. Apparatus particularly adapted to load or unload a buoyant vehicle from another vehicle supported by the atmosphere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

137.2+, for apparatus for loading or unloading aircraft while that aircraft is resting in the water.

137.7 Marine vessel to/from water:
This subclass is indented under subclass 137.1. Apparatus particularly adapted to load or unload a buoyant vehicle directly from the water in or on which it floats.

SEE OR SEARCH THIS CLASS, SUBCLASS:

139.4+, for means for marine vessel loading or unloading from the shore or from the sea bottom.

SEE OR SEARCH CLASS:

37, Excavating, subclasses 317+ for a dredge combined with handling equipment therefor. Generally, the handling structure for lifting a dredge including details of the dredge guide will be found in Class 37 even without specific details to the dredge. Search especially subclasses 315+ for a shellfish dredge.

43, Fishing, Trapping, and Vermin Destroying, subclass 8 for a fishing net combined with handling equipment therefor. Generally, the handling structure for lifting a fishing net including details of the net guide will be found in Class 43 even without specific details to the net.

114, Ships, subclasses 27+ for a scow (or barge or "buoyant vehicle") intended to be unloaded by dumping its cargo into the water. ("Dumping" may comprise the use of a door in the bottom of the scow, use of a conveyor to transport the cargo over the side of the scow or use of means to bodily lift and dump it into the water.) However, the combination of a scow with means to load and with means to dump the scow is to be found in this subclass of Class 414.

137.8 Marine vessel to/from lighter to/from water:
This subclass is indented under subclass 137.7. Apparatus wherein the buoyant vehicle loaded or unloaded from the water serves to hold the cargo only temporarily, with provision to transport cargo with respect to a second buoyant vehicle.

(1) Note. The term "lighter" is somewhat confused in the art, and is considered to refer to any buoyant vehicle intended to support and transfer material from a transport buoyant vehicle to a receiver and may comprise any of various structures, e.g., a small boat on which a material handling device is carried, or a large vessel having the purpose of transporting material from another vessel and the water at a single portage. The lighter may include a hold for temporary storage of material.

137.9 Marine vessel to marine vessel:
This subclass is indented under subclass 137.1. Apparatus particularly adapted to load or unload a buoyant vehicle from or to another buoyant vehicle.

138.1 With means to effect relative vertical movement of marine vessel:
This subclass is indented under subclass 137.9. Apparatus combined with structure to cause one of the buoyant vehicles to move with respect to the surface of the water in or on which the vehicles float.

SEE OR SEARCH THIS CLASS, SUBCLASS:

140.6, for means to move cargo between a marine vessel and the shore with provision to effect vertical movement of the marine vessel.

SEE OR SEARCH CLASS:

114, Ships, subclasses 258+ for a "mother" buoyant vehicle combined with specific means to lift a "daughter" craft to or from the water. Search subclasses 365+ for means to lift a life boat to or from the water.

138.2 With means to compensate for relative marine vessel movement:

This subclass is indented under subclass 137.9. Apparatus combined with means to take into account and make adjustment for repositioning of one of the buoyant vehicles with respect to the other.

(1) Note. Means intended to effect relative movement of the buoyant vehicles, a break-a-way feature or a simple friction holder is considered to be "means to make adjustment" for classification in this and the indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

139.6+, for marine vessel loading or unloading with provision for movement of the vessel with respect to the shore.

138.3 Including means to sense position of marine vessel:

This subclass is indented under subclass 138.2. Apparatus having a detector responsive to the location of one of the buoyant vehicles.

138.4 Line tension control:

This subclass is indented under subclass 138.2. Apparatus having a taut line between the buoyant vehicles and having means to establish and maintain a desired tautness thereon.

138.5 Marine vessel to/from lighter to/from marine vessel:

This subclass is indented under subclass 137.9. Apparatus including a third buoyant vehicle intended to load or unload the first buoyant vehicle and transfer the material to or from the second buoyant vehicle.

(1) Note. The term "lighter" is somewhat confused in the art, and is considered to refer to any buoyant vehicle intended to support and transfer material from a transport buoyant vehicle to a receiver, and may comprise any of various structures, e.g., a small boat on which a material handling device is carried, or a large vessel having the purpose of transporting material between other vessels at a single portage. The lighter may include a hold for temporary storage of material. Such a vessel may also be referred to as a "tender" or and "oiler".

SEE OR SEARCH THIS CLASS, SUBCLASS:

137.1+, especially 142.1+, 142.6, 142.7, and 142.9, for a "lighter" with handling structure, but without a ship to be loaded or unloaded.

138.6 By use of endless belt conveyor:

This subclass is indented under subclass 138.5. Apparatus wherein the loading or unloading structure includes a pliable loop supported at its extremities by rollerlike members to allow the loop to travel along its extent which loop is configured to transport material being loaded on or unloaded from the buoyant vehicle.

138.7 Marine vessel to/from lighter to/from shore:

This subclass is indented under subclass 137.9. Apparatus including a buoyant vehicle intended to load or unload another buoyant vehicle and transport the material to/from the terra firma surrounding or beneath the water in or on which the buoyant vehicle floats.

(1) Note. The term "lighter" is somewhat confused in the art, and is considered to refer to any vessel intended to support such transported material which includes a small boat on which a material handling device is carried, a floating structure that is in effect an extension of a dock, or a large vessel having the purpose of transporting material to or from another vessel at a single portage. The lighter may include a hold for temporary storage of material. Such a vessel may

also be referred to as a "tender" or as an "oiler".

(2) Note. The term "shore" is intended to include the land surrounding the water as well as the sea bottom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

137.1+, especially 142.1+, 142.6, 142.7, and 142.9, for a "lighter" with handling structure, but without a ship to be loaded or unloaded.

138.8 With marine vessel holding or moving device:

This subclass is indented under subclass 138.7. Apparatus combined with structure to either immobilize or to effect movement of the buoyant vessel being loaded or unloaded.

138.9 Serial marine vessels supporting conveyor:

This subclass is indented under subclass 138.7. Apparatus wherein the buoyant vehicle intended to load or unload the other includes a plurality of distinct buoyant vehicles for supporting the loading or unloading structure on the water.

139.1 By use of endless belt conveyor:

This subclass is indented under subclass 138.7. Apparatus wherein the loading or unloading structure includes a pliable loop supported at its extremities by rollerlike members to allow the loop to travel along its extent which loop is configured to transport material being loaded on or unloaded from the buoyant vehicle.

139.2 One marine vessel towing the other:

This subclass is indented under subclass 137.9. Apparatus intended to be used as one of the buoyant vehicles pulls the other through the water.

139.3 By use of endless belt conveyor:

This subclass is indented under subclass 137.9. Apparatus wherein the loading or unloading structure includes a pliable loop supported at its extremities by rollerlike members to allow the loop to travel along its extent; which loop is configured to transport material being loaded on or unloaded from the buoyant vehicle.

139.4 Marine vessel to/from shore:

This subclass is indented under subclass 137.1. Apparatus Particularly adapted to load or unload a buoyant vehicle and transport the material to/from the terra firma surrounding or beneath the water in or on which the buoyant vehicle floats or to/from structure supported by the terra firma.

(1) Note. The term "shore" is intended to include the land surrounding the water as well as the sea bottom.

(2) Note. Disclosure of a marine vessel and shore with a claimed conveyor structure is classifiable in this and the indented subclasses.

139.5 Personnel loading or unloading:

This subclass is indented under subclass 139.4. Apparatus intended to be used for charging or discharging human beings to or from a buoyant vehicle.

(1) Note. Handling of personnel is generally not included in this class (414) but of art of this subclass is closely related to the other art of this area and accordingly is collected herein.

139.6 With means to compensate for marine vessel movement:

This subclass is indented under subclass 139.4. Apparatus combined with means to take into account and make adjustment of repositioning of the buoyant vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

138.2+, for movement of cargo from one marine vessel to another with compensation for relative movement therebetween.

139.7 Including means to sense vertical position of marine vessel (e.g., draft, etc.):

This subclass is indented under subclass 139.6. Apparatus having a detector is responsive to the depth of the buoyant vehicle in the water.

139.8 With marine vessel holding or moving device:
This subclass is indented under subclass 139.4. Apparatus combined with structure to either immobilize or effect movement of the buoyant vehicle being loaded or unloaded.

139.9 Marine vessel to/from land or rail vehicle distinct from system:
This subclass is indented under subclass 139.4. Apparatus particularly adapted to load or unload a buoyant vehicle and transport the material to or from a vehicle riding directly on the terra firma, or on a rail supported by the terra firma, and which vehicle is a transportation device forming no part of the loading or unloading device.

140.1 By use of marine vessel to/from shore gangway for land or rail vehicle:
This subclass is indented under subclass 139.9. Apparatus intended to be used with a bridgelike device to move material between the buoyant vehicle and the terra firma.

SEE OR SEARCH CLASS:
14, Bridges, especially subclasses 71.1+ for a gangway, generally, including a gangway attached to a marine vessel. A bridge or gangway for use with a buoyant vehicle including means to effect movement of cargo thereon (e.g., a windlass) is to be found in this subclass.

140.2 By use of endless belt conveyor:
This subclass is indented under subclass 139.9. Apparatus wherein the loading or unloading structure includes a pliable loop supported at its extremities by rollerlike members to allow the loop to travel along its extent which loop is configured to transport material being loaded on or unloaded from the buoyant vehicle.

140.3 By use of laterally moving crane:
This subclass is indented under subclass 139.9. Apparatus wherein the loading or unloading structure includes an overhead beam having material transporting carriage means suspended therefrom for movement therealong wherein the beam is supported for movement bodily transversely to its extent, while remaining parallel to its original orientation.

140.4 By use of swinging crane:
This subclass is indented under subclass 139.9. Apparatus wherein the loading or unloading structure includes an overhead beam having material transporting carriage means suspended therefrom for movement therealong wherein the beam is supported for movement about an axis normal to its longitudinal extent.

140.5 By use of conveyor chute:
This subclass is indented under subclass 139.9. Apparatus wherein the loading or unloading structure includes an inclined trough vertically higher on its input end than its exhaust end for transportation of material therealong by the force of gravity.

140.6 By lifting marine vessel or by changing water level:
This subclass is indented under subclass 139.4. Apparatus wherein loading or unloading is effected or influenced (a) by raising or lowering the buoyant vehicle with respect to the surface of the water on which it floats; (b) by changing the vertical height of the water on which the buoyant vehicle floats.

(1) Note. Under clause (b), the height of the water may be changed naturally, as by tide, or may be changed artificially, as by a “lock”.

SEE OR SEARCH THIS CLASS, SUBCLASS:
138.1, for means to raise or lower one marine vessel with respect to another to effect or influence the transfer of cargo therebetween.

SEE OR SEARCH CLASS:
114, Ships, subclasses 258+ for a “mother” buoyant vehicle combined with specific means to lift a “daughter” craft to or from the water. Search subclasses 365+ for means to lift a life boat to or from the water.

140.7 By use of screw conveyor:
This subclass is indented under subclass 139.4. Apparatus wherein the loading or unloading structure includes a helically ribbed, rodlike member adapted to turn about its axis and force

material being loaded or unloaded to move by the action of the helical rib.

140.8 By use of endless belt conveyor:
This subclass is indented under subclass 139.4. Apparatus wherein the loading or unloading structure includes a pliable loop supported at its extremities by rollerlike members to allow the loop to travel along its extent which loop is configured to transport material being loaded on or unloaded from the buoyant vehicle.

140.9 For "bulk" (e.g., granular, etc.) cargo:
This subclass is indented under subclass 140.8. Apparatus particularly adapted to transport material having no defined shape.

141.1 Including orbiting bucket:
This subclass is indented under subclass 140.9. Apparatus including a defined compartment including a bottom and two (or more) sides comprising a part of, or secured to the pliable, elongated band for containment of the transported material.

141.2 With grab bucket:
This subclass is indented under subclass 140.9. Apparatus combined with a compartment member comprised of a pair of cooperating, biting jaws particularly adapted to cut into a supply quantity of material and transport that material to the pliable, elongated band.

141.3 By use of laterally moving crane:
This subclass is indented under subclass 139.4. Apparatus wherein the loading or unloading structure includes an overhead beam having material transporting carriage means suspended therefrom for movement therealong, wherein the beam is supported for movement bodily transversely to its extent.

141.4 Having swinging portion:
This subclass is indented under subclass 141.3. Apparatus wherein the overhead beam or a part thereof is also supported for movement about an axis normal to its longitudinal extent.

141.5 On marine vessel:
This subclass is indented under subclass 141.3. Apparatus wherein the overhead beam is supported by the buoyant vehicle.

141.6 By use of swinging crane:
This subclass is indented under subclass 139.4. Apparatus wherein the loading or unloading structure includes an overhead beam having material transporting carriage means suspended therefrom for movement therealong wherein the beam is supported for movement about an axis normal to its longitudinal extent.

141.7 By use of hoist line:
This subclass is indented under subclass 139.4. Apparatus wherein the loading or unloading structure includes a tensile line(s) for lifting and transporting cargo.

SEE OR SEARCH THIS CLASS, SUBCLASS:

141.3+, for a hoist line for loading or unloading a marine vessel by use of a hoist line wherein the hoist line is supported by a laterally moving crane.

141.8 By use of conveyor chute:
This subclass is indented under subclass 139.4. Apparatus wherein the loading or unloading structure includes a trough vertically higher on its input end than its exhaust end for transportation of material therealong by the force of gravity.

141.9 By use of screw conveyor on marine vessel:
This subclass is indented under subclass 137.1. Apparatus wherein the loading or unloading structure includes a helical ribbed, rodlike member adapted to turn about its axis and force material being loaded or unloaded to move by the action of the helical rib, and wherein that helically ribbed member is supported by the buoyant vehicle.

142.1 By use of endless belt conveyor on marine vessel:
This subclass is indented under subclass 137.1. Apparatus wherein the loading or unloading structure includes a pliable loop supported at its extremities by rollerlike members to allow the loop to travel along its extent which loop is configured to transport material being loaded on or unloaded from the buoyant vehicle, and wherein the pliable loop is supported by the buoyant vehicle.

142.2 For "bulk" (e.g., granular) cargo:
This subclass is indented under subclass 142.1. Apparatus particularly adapted to transport of material having no defined shape.

142.3 Belt extending parallel to marine vessel beneath cargo hold:
This subclass is indented under subclass 142.2. Apparatus wherein the buoyant vehicle includes a chamber for holding the material, and wherein the run of the pliable loop is in the same direction as the keel of the buoyant vehicle and is physically lower than the bottom of the holding chamber such that material in the chamber can flow onto the pliable loop, to be transported thereby.

142.4 Sequential endless belts:
This subclass is indented under subclass 142.3. Apparatus including a first and a second pliable loop to transport material along its extend, wherein the material is first transported by the first loop and then that same material is further transported by the second loop.

142.5 Including orbiting bucket:
This subclass is indented under subclass 142.2. Apparatus including a defined compartment having a bottom and two (or more) sides comprising a part of, or secured to, the pliable, elongated band for containment of the transported material.

142.6 By use of laterally moving crane on marine vessel:
This subclass is indented under subclass 137.1. Apparatus wherein the loading or unloading structure includes an overhead beam having material transporting carriage means suspended therefrom for movement therealong wherein the beam is supported for movement bodily transversely to its extent, while remaining parallel to its original orientation, and wherein the overhead beam is supported by the buoyant vehicle.

(1) Note. The beam of this subclass commonly extends transversely of the buoyant vehicle and such beam moves longitudinally with respect to the vehicle.

142.7 By use of swinging crane on marine vessel:
This subclass is indented under subclass 137.1. Apparatus wherein the loading or unloading structure includes an overhead beam having material transporting carriage means suspended therefrom for movement therealong wherein the beam is supported for movement about an axis normal to its longitudinal extent, and wherein the overhead beam is supported by the buoyant vehicle.

142.8 By use of hoist line:
This subclass is indented under subclass 137.1. Apparatus wherein the loading or unloading structure includes a tensile line(s) for lifting and transporting cargo.

142.9 Scoop or scraper on marine vessel:
This subclass is indented under subclass 142.8. Apparatus wherein the loading or unloading structure includes (a) a compartment member suspended from the tensile line(s) having a digging edge for biting into a supply of material, or (b) a digging edge, per se, for biting into a supply of material wherein the compartment member or the digging edge, per se, is supported by the buoyant vehicle.

(1) Note. A device for penetrating a supply of bulk material, e.g., a clam-shell bucket, is considered to have a digging edge for placement in this subclass.

143.1 By use of conveyor chute:
This subclass is indented under subclass 137.1. Apparatus wherein the loading or unloading structure includes a trough vertically higher on its input end than its exhaust end for transportation of material therealong by the force of gravity.

143.2 Stowage arrangement on marine vessel:
This subclass is indented under subclass 137.1. Apparatus including provision to retain loaded material on the buoyant vehicle.

146 CHARGING OR DISCHARGING MEANS ADAPTED FOR USE IN A RADIOACTIVE ENVIRONMENT:
This subclass is indented under the class definition. Apparatus comprising means for moving material, usually of a radioactive nature, toward, to, into, within, out of, from, away

from, etc., a nominally claimed radioactive container or structure intimately associated therewith.

SEE OR SEARCH THIS CLASS, SUBCLASS:

290, for a receptacle which contains liquid in which a charge may be submergibly sealed, and means to move the charge thereto or therefrom.

SEE OR SEARCH CLASS:

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 261+ for the combination of nuclear reactor structure and a means for handling nuclear fuel, which means may be for loading or unloading the fuel into or from the reactor; and subclasses 268+ for nuclear reactor refueling machines.

147 CHAMBER OF A TYPE UTILIZED FOR A HEATING FUNCTION AND MATERIAL CHARGING OR DISCHARGING MEANS THEREFOR:

This subclass is indented under the class definition. Apparatus comprising a receptacle-like structure (e.g., furnace, oven, etc.) of a kind adapted to be provided with means for heating it, and means for moving, or enabling gravity movement of, either (a) material in the nature of work which is to be heated in the structure, or (b) material in the nature of fuel which is to be consumed during a work-heating operation, to, adjacent to, into, out of, from, within, etc., the structure.

(1) Note. While the basic concept of this and the indented subclasses is that of the combination of the chamber and the means for charging or discharging material thereto of therefrom, rigid adherence to that concept would have resulted in a considerable scattering of the art of the predecessor area (subclasses 18-37 of former Class 214). Accordingly, claims to the charging or discharging means are originally classifiable here (with the below-mentioned exception) if the claims make clear, or if such is the sole disclosure, that the destination of source of the material is a chamber of the kind under consideration. However, exceptions are made in the instance of a charging or discharging means which is proper for Class 198, or one which is proper for some other area of this class (414), in which event original classification is there and the patent is cross-referenced to this area (147+).

(2) Note. The claiming of, for example, (a) a heating chamber and heating means therefor, with or without a charging or discharging means, or (b) structure of a heating chamber which relates only to its heating function (e.g., lining, configuration, etc.) or (c) discharging work which is molten in form, and is handled as a liquid (e.g., not merely as the contents of a receptacle), from a heating chamber, presents subject matter which is beyond the scope of this class (414).

SEE OR SEARCH THIS CLASS, SUBCLASS:

146, for charging or discharging means adapted for use with a nuclear reactor.

804, for a process of material charging or discharging of a chamber of a type utilized for a heating function.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, appropriate subclasses for such apparatus having charging and discharging means.

48, Gas: Heating and Illuminating, subclass 86 for means to feed fuel to cupola-gas generators.

65, Glass Manufacturing, subclasses 335+ for a glass furnace combined with furnace charging means.

110, Furnaces, subclasses 101+, 196+, 235+, 267+, and 293+ for devices combined with furnace structure which feed fuel to furnaces, and subclasses 165+ for ash discharging.

122, Liquid Heaters and Vaporizers, appropriate subclasses for feeding fuel to such apparatus.

126, Stoves and Furnaces, subclass 223 for trash burning cooking stoves with feeding attachments, subclasses 7, 10, 68, 73, 107, and 501 for various types of stoves having fuel feeding maga-

zines, and subclasses 242+ for ash discharging.

198, Conveyors: Power-Driven, subclasses 339.1+ for the combination of a conveyor of that class and means to facilitate the working, treating, or inspecting of a conveyed load at a station.

201, Distillation: Processes, Thermolytic, subclass 40 for a thermolytic distillation process including the step of arranging the charge in the distillation zone.

202, Distillation: Apparatus, subclasses 262+ for means for introducing material into, or removing it from, a still, retort, or the like (e.g., a coke oven).

212, Traversing Hoists, subclasses 221, 243 and 251 for hoists usable as charging devices.

266, Metallurgical Apparatus, subclasses 176+ for solid material charging apparatus combined with the structure of a metallurgical furnace.

373, Industrial Electric Heating Furnaces, subclasses 33+, 79+, 115, and 142+ for charging devices.

432, Heating, subclasses 121+ for a work chamber having heating means and structure by which work is progressed or moved mechanically; and subclasses 239+ for a specialized heating furnace subcombination for feeding, agitating, conveying, or discharging work being heated.

148 With alarm, indicator, or signal:

This subclass is indented under subclass 147. Apparatus wherein the chamber or the material moving means includes means to sense a condition therein or thereof and to react thereto by providing an indication of the status of the condition sensed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

289, for an alarm, indicator, or signal responsive to a sensing means in a system involving a static receptacle and a charging or discharging means therefor.

SEE OR SEARCH CLASS:

116, Signals and Indicators, appropriate subclasses for an alarm, indicator, or signal of a mechanical nature.

340, Communications: Electrical, appropriate subclasses for an alarm, indicator, or signal of an electrical nature.

149 Driven, rotatable chamber:

This subclass is indented under subclass 147. Apparatus in which the heating chamber is rotatably driven through at least 360° about an axis which passes through the chamber (e.g., a rotary-cement kiln).

150 Including driven device and/or inclined flow path to carry or convey material into, within, and out of chamber:

This subclass is indented under subclass 147. Apparatus wherein the means for moving, or enabling gravity movement of, the material includes a driven device and/or an inclined flow path to carry or convey the material into, within, and out of the heating chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

298, for a receptacle charging means which also serves to discharge the receptacle.

151 In helical or tortuous path:

This subclass is indented under subclass 150. Apparatus wherein the driven device or inclined path for carrying or conveying the material within the chamber causes the material to follow a helical or tortuous path through the chamber.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, subclasses 203+ for conveyors providing plural or zigzag paths for treated material within kilns, houses, or containers.

152 With means outside of chamber to carry or guide material to, or from, device or path:

This subclass is indented under subclass 150. Apparatus with means ahead of the chamber entrance, or beyond the chamber exit, to carry or guide the material to, or from, the driven device or inclined flow path.

153 With driven means within chamber to manipulate or transfer material:
This subclass is indented under subclass 150. Apparatus provided with driven means within the chamber to manipulate the work with respect to the device or path, or to transfer the work to or from the device or path onto supporting structure within the chamber.

154 Including track-guided, wheeled vehicle:
This subclass is indented under subclass 150. Apparatus wherein the means for moving the material includes a track-guided, wheeled vehicle.

155 Having means to support material suspended therebelow:
This subclass is indented under subclass 154. Apparatus in which the material is supported on a member located below the wheels of the vehicle.

156 Including reciprocating or vibratory conveyor:
This subclass is indented under subclass 150. Apparatus wherein the means for moving the material includes a conveyor of the reciprocating or vibratory type.

SEE OR SEARCH CLASS:
34, Drying and Gas or Vapor Contact With Solids, subclass 206 for pusher-type conveyors providing for moving treated material within kilns, houses, or containers.

157 Including endless conveyor (e.g., apron, pusher type etc.):
This subclass is indented under subclass 150. Apparatus wherein the means for moving the material includes a conveyor of the endless type.

SEE OR SEARCH CLASS:
34, Drying and Gas or Vapor Contact With Solids, subclasses 207 and 208 for endless conveyors for moving treated material within kilns, houses, or containers.

158 Including screw, rotary, or rotating pusher, conveyor:
This subclass is indented under subclass 150. Apparatus wherein the means for moving the material includes a conveyor of either a screw type, a rotary type, or a rotating pusher type.

159 Including roller conveyor:
This subclass is indented under subclass 150. Apparatus wherein the means for moving the material includes a conveyor comprised of a plurality of powered rollers.

160 Charging of chamber:
This subclass is indented under subclass 147. Apparatus in which the means for moving, or enabling gravity movement of, the material carries or conveys it to, adjacent to, or into the chamber.

161 With control system responsive to condition in chamber:
This subclass is indented under subclass 160. Apparatus wherein a system is provided for controlling the material-moving means, which system includes means for determining a condition (e.g., material level, location of material, etc.) which exists within the chamber and for responding thereto by causing the material-moving means to operate in a manner which will correct or otherwise change the condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:
294+, for the combination of a static receptacle and charging or charge distributing means therefor, and wherein the combination includes means for responding to a condition which exists in the receptacle or the charging or charge distributing means.

SEE OR SEARCH CLASS:
110, Furnaces, subclass 101 for fuel feeders responsive to fuel bed conditions.
222, Dispensing, subclass 56 for dispensers in which the discharge is controlled by the quantity in a receiver which is also discharging (e.g., using).

162 Through plural ports in top of chamber:
This subclass is indented under subclass 160. Apparatus wherein the material moving means and/or the means enabling gravity movement introduces the material into the chamber through plural entrances located in the top of the chamber.

163 From vehicle-carried hopper located above ports:
This subclass is indented under subclass 162. Apparatus in which the material moving means includes a vehicle-carried hopper which is positioned above the entrances of the chamber while material is moving from the hopper to the chamber.

SEE OR SEARCH CLASS:
202, Distillation: Apparatus, as explained in the reference thereto appearing in subclass 147 above.

164 With closures for ports and means on vehicle to manipulate them:
This subclass is indented under subclass 163. Apparatus wherein the chamber entrances have closures and the hopper-carrying vehicle has means located thereon to operate (e.g., open) the closures.

165 By depositing material onto surface of glass melt:
This subclass is indented under subclass 160. Apparatus wherein the means for moving, or enabling gravity movement of, the material deposits it onto the surface of a glass melt located, at least in part, within the chamber.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, subclass 335 for a glass furnace having charging means.
373, Industrial Electric Heating Furnaces, for charging or discharging electric glass furnaces.

166 With pushing device to move material therealong:
This subclass is indented under subclass 165. Apparatus in which a device is provided for pushing the material along the surface of the glass melt after it has been placed thereon by the charging means.

167 By driven device for transporting material to a stationary, at least in part, accumulating means for subsequent release into chamber by gravity:
This subclass is indented under subclass 160. Apparatus wherein the means for moving material includes a driven, material-transporting device and a stationary, at least in part relative to the chamber, material accumulating means which receives the material from the device and then releases it into the chamber by gravity.

168 Receptacle moved back and forth along inclined way (e.g., skip, etc.):
This subclass is indented under subclass 167. Apparatus in which the driven device is a receptacle which reciprocates along an inclined way between a load receiving point and the accumulating means.

169 Accumulating means includes serially arranged closures:
This subclass is indented under subclass 168. Apparatus wherein the material accumulating means includes two or more serially-arranged closures (e.g., to inhibit change in pressure gradient), one of which releases the material into the chamber.

(1) Note. While it is necessary that each closure occupy a flow-path-blocking position during some portion of a chamber-charging cycle, it is not necessary that more than one closure be in such a position (i.e., a position in which it stops incoming material) during the period in which a charge is being accumulated for release into the chamber.

170 Each comprising bell of bell and hopper type accumulating means:
This subclass is indented under subclass 169. Apparatus wherein each of the closures comprises a bell of the kind found in a material accumulating means of the bell and hopper type.

(1) Note. Most frequently, a plurality of bells is indicative of a plurality of hoppers; occasionally, however, a single hopper is provided with a plurality of bells (e.g., one at its outlet).

SEE OR SEARCH CLASS:

266, Metallurgical Apparatus, subclass 184 for means for treating ores or for extracting metals wherein the means applies heat to the work (e.g., the means is a furnace), and further wherein means is provided for moving the work through the heat applying means, and lastly wherein the moving means includes a storage chamber having a discharge port in the bottom thereof which port is closed by a valve member which is movable axially of the port (i.e., a bell and hopper arrangement).

171 Conveyor:

This subclass is indented under subclass 167. Apparatus in which the driven device is a conveyor.

172 By driven device for transporting material to and/or into, or into and within chamber:

This subclass is indented under subclass 160. Apparatus wherein the means for moving material includes a driven device for transporting material to, toward, into, or into and within the chamber.

173 Plural, successive, driven devices:

This subclass is indented under subclass 172. Apparatus wherein the means for moving material includes two or more successive, driven material transporting devices (e.g., successive conveyors, conveyor and carrier, etc.).

174 Thrower and at least one feeder conveyor therefor:

This subclass is indented under subclass 173. Apparatus in which one of the driven devices comprises means for projecting material by exerting a force on said material to move the same and then causing said force to be released from said material, whereby said material will be projected and continue to move unsupported, in a trajectory, over a horizontal distance to, into, or within the chamber, and the other driven device comprises one or more conveyors which feed material to the former device.

SEE OR SEARCH CLASS:

110, Furnaces, subclasses 104+ for a blower feeding fuel to a furnace.

198, Conveyors: Power-Driven, subclasses 638+ for thrower-type conveyors.

175 Including screw conveyor:

This subclass is indented under subclass 174. Apparatus wherein the feed conveyor is, or the feed conveyors include, a conveyor of the screw-type.

176 Including pusher conveyor:

This subclass is indented under subclass 174. Apparatus wherein the feed conveyor is, or the feed conveyors include, a conveyor of the pusher-type.

177 Two or more conveyors, one traversing open top, or opening in top of, chamber:

This subclass is indented under subclass 173. Apparatus wherein the driven devices include two or more conveyors in series, one of which traverses an opening in the top of, or an open top of, the chamber to distribute the material within.

178 Receptacle moved back and forth along inclined way (e.g., skip):

This subclass is indented under subclass 172. Apparatus in which the driven device is a receptacle which reciprocates along an inclined way between a load receiving point and the chamber.

179 Moveably mounted conveyor traverses open top, or opening in top of, chamber:

This subclass is indented under subclass 172. Apparatus wherein the driven device includes a conveyor which traverses an opening in the top of, or an open top of, the chamber to distribute material within.

SEE OR SEARCH THIS CLASS, SUBCLASS:

177, for the combination of a device of this subclass and an infeed conveyor therefor.

180 Including apparatus to advance a material-supporting element to a point within chamber, release material, and retract element:
This subclass is indented under subclass 172. Apparatus wherein the driven device includes apparatus to advance a material-supporting element to a point within the chamber, release material from the element, and retract the element from the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:
150+, for a driven device including a material-supporting element which moves material to a point within the chamber, and may (a) release the material, retract the element, and return to retrieve the material from the chamber, or (b) release the material onto a device or path which carries the material through and out of the chamber.

181 With driven means to eject material from element:
This subclass is indented under subclass 180. Apparatus provided with driven means for ejecting the material supported by the element into the material heating or consuming portion of the chamber.

182 Element comprises tiltable, material-underlying support:
This subclass is indented under subclass 180. Apparatus in which the element is a material-underlying support which tilts in its entirety to release by gravity the material into the material heating or consuming portion of the chamber.

183 Receptacle separable from apparatus (e.g., for refilling):
This subclass is indented under subclass 182. Apparatus wherein the material-underlying support is a receptacle which is separable from the apparatus.

184 Receptacle tiltable about axis parallel to direction of apparatus advance:
This subclass is indented under subclass 182. Apparatus wherein the material-underlying support is a receptacle tiltable about an axis parallel to the direction of the advance of the apparatus into the chamber.

185 Element comprises receptacle having bottom outlet:
This subclass is indented under subclass 180. Apparatus wherein the material-supporting element is a receptacle which has an outlet in a lower portion thereof.

186 Element comprises grab:
This subclass is indented under subclass 180. Apparatus wherein the material-supporting element is a grab which discharges the material by releasing its grip thereon.

187 Material accumulating and holding structure, and driven conveyor therein serving to move (e.g., eject) material from structure to chamber:
This subclass is indented under subclass 172. Apparatus in which the driven device includes, or consists of, a material accumulating and holding structure and a driven conveyor located in, or forming a part of, the structure to remove material from the structure and direct it into the chamber.

188 Including wheeled carriage for supporting the structure:
This subclass is indented under subclass 187. Apparatus in which the material accumulating and holding structure is mounted and supported on a wheeled carriage for movement relative to the chamber.

189 Driven conveyor comprises rotatable, pocketed gate:
This subclass is indented under subclass 187. Apparatus wherein the driven conveyor comprises a rotatable, pocketed gate which forms part of the accumulating and holding structure.

SEE OR SEARCH CLASS:
222, Dispensing, subclasses 367+ for a dispenser having a discharge assistant in the form of a rotary conveyor-type trap chamber.

190 Screw conveyor:
This subclass is indented under subclass 187. Apparatus wherein the driven conveyor comprises a conveyor of the screw type located, at least in part, within the accumulating and holding structure.

SEE OR SEARCH CLASS:
110, Furnaces, subclass 110 for a screw conveyor which moves material from a hopper into a furnace.

191 Traversing hoist having material-underlying support or material attracting or gripping means:
This subclass is indented under subclass 172. Apparatus wherein the driven device comprises a traversing hoist having means located thereon to attract or grip the material or an underlying member to support the material.

SEE OR SEARCH CLASS:
212, Traversing Hoists, appropriate subclasses for a hoist of that class having means for handling a load.

192 Carrier-mounted, tiltable receptacle:
This subclass is indented under subclass 172. Apparatus wherein the driven device includes a tiltable receptacle (e.g., bin, container, etc.) mounted on a driven carrier.

SEE OR SEARCH THIS CLASS, SUBCLASS:
303+, for charging a static receptacle by gravity flow from a portable load carrier.

193 Thrower:
This subclass is indented under subclass 172. Apparatus wherein the driven device comprises means for projecting material by first exerting a force on said material to move the same and then causing said force to be released from said material, whereby said material will be projected and continue to move unsupported, in a trajectory, over a horizontal distance to or into the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:
174, for a similar device combined with a feeder conveyor.

SEE OR SEARCH CLASS:
110, Furnaces, subclasses 104+ for a blower for feeding fuel to a furnace.
198, Conveyors: Power-Driven, subclasses 638+ for a thrower type of conveyor.

194 Reciprocating or oscillating:
This subclass is indented under subclass 193. Apparatus wherein the thrower includes a member which reciprocates or oscillates relative to the chamber and the material is projected to or into the chamber as a result of its contact with the member.

195 Rotary:
This subclass is indented under subclass 193. Apparatus wherein the thrower includes a member which revolves about an axis and the material is projected to or into the chamber as a result of its contact with the member.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 642 for a rotary thrower type of conveyor.

196 Conveyor:
This subclass is indented under subclass 172. Apparatus wherein the driven device comprises a conveyor.

197 Screw:
This subclass is indented under subclass 196. Apparatus wherein the conveyor is of the screw type.

198 Reciprocating pusher or reciprocating conveying surface:
This subclass is indented under subclass 196. Apparatus wherein the conveyor comprises a reciprocating pusher or a reciprocating conveying surface.

SEE OR SEARCH CLASS:
110, Furnaces, subclasses 109 and 114 for reciprocating-type fuel feeders.

199 By material-supporting structure movable, or having a movable component, to release material into chamber by gravity:
This subclass is indented under subclass 160. Apparatus wherein the means enabling movement of material includes material-supporting structure movable, or having a portion thereof movable, to release by gravity material into the chamber (e.g., gated hopper, tilting bin, etc.).

200 Including serially arranged closures:
This subclass is indented under subclass 199. Apparatus wherein the supporting structure includes two or more serially arranged closures (e.g., to inhibit change in pressure gradient), one of which releases the material into the chamber.

(1) Note. While it is necessary that each closure occupy a flow-path-blocking position during some portion of a chamber-charging cycle, it is not necessary that more than one closure be in such a position (i.e., a position in which it stops incoming material) during the period in which a charge is being accumulated for release into the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:
169+, for a similar device in combination with a receptacle movable back and forth along an inclined way.

201 At least one comprising bell of bell and hopper type supporting structure:
This subclass is indented under subclass 200. Apparatus in which one or more of the closures comprises a bell of the kind found in a material supporting structure of the bell and hopper type.

SEE OR SEARCH CLASS:
266, Metallurgical Apparatus, subclass 184 as explained in the reference thereto appearing in subclass 170 above.

202 With means to improve seal between mating surfaces:
This subclass is indented under subclass 201. Apparatus wherein means is provided on the bell or hopper to improve the seal between the mating surfaces of these members.

203 Having bell and/or hopper mounted for rotation:
This subclass is indented under subclass 201. Apparatus wherein either the bell or the cooperating hopper is, or both are, mounted for rotation relative to the other portions of the supporting structure (e.g., to distribute material which is on the bell).

204 Bell and hopper:
This subclass is indented under subclass 199. Apparatus wherein the supporting structure is a hopper with a closure in the form of a material-supporting bell.

SEE OR SEARCH CLASS:
266, Metallurgical Apparatus, subclass 184 as explained in the reference thereto appearing in subclass 170 above.

205 With means to distribute material after release from structure:
This subclass is indented under subclass 204. Apparatus provided with means to distribute the material after it has been released by the supporting structure into the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:
300+, for driven, charge distributing means in combination with a receptacle.

SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclass 85.2 for a cupola having a fuel agitating stirrer.

206 With means to distribute material after release from structure:
This subclass is indented under subclass 199. Apparatus provided with means to distribute the material after it has been released by the supporting structure into the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:
300+, for driven, charge distributing means in combination with a receptacle.

SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclass 85.2 as explained in the reference thereto appearing in subclass 205 above.

207 Comprising a tiltable material containing member:
This subclass is indented under subclass 199. Apparatus in which the supporting structure comprises a material containing member (e.g., bin, container, receptacle, etc.) which tilts to dump material into the chamber.

208 By inclined flow path:
This subclass is indented under subclass 160. Apparatus in which the means enabling gravity movement includes an inclined flow path.

SEE OR SEARCH CLASS:
193, Conveyors, Chutes, Skids, Guides, and Ways, appropriate subclasses for gravity conveyors, per se.

209 Discharging of chamber by driven device:
This subclass is indented under subclass 147. Apparatus in which the means for moving the material is a driven device which discharges the material out of, from, etc., the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:
304+, for nongravity discharging means for a static receptacle.

210 With means beyond chamber exit to move or guide material discharged therefrom by the device:
This subclass is indented under subclass 209. Apparatus comprising an additional device for carrying or conveying, or structure for conducting, or supporting and conducting, the material upon its departure from the chamber.

211 Means comprises endless or rotary conveyor:
This subclass is indented under subclass 210. Apparatus wherein the additional device is an endless or rotary conveyor.

212 Means comprises portable (e.g., vehicle mounted, etc.) material receiving chute:
This subclass is indented under subclass 210. Apparatus wherein the conducting, or supporting and conducting, structure is a chute mounted for relocation.

213 Device comprises screw conveyor:
This subclass is indented under subclass 209. Apparatus wherein the driven device is a conveyor of the screw type.

214 Device comprises pushing or pulling mechanism:
This subclass is indented under subclass 209. Apparatus wherein the driven device comprises mechanism for pushing or pulling (e.g., pusher-type endless conveyor, reciprocating pusher, etc.) the material from the chamber.

215 Mechanism repositionable for serving plural chambers:
This subclass is indented under subclass 214. Apparatus in which the mechanism is repositionable for discharging several different chambers.

216 Discharging of chamber by gravity, and means beyond exit thereof to guide, move, or stop material:
This subclass is indented under subclass 147. Apparatus wherein the chamber is discharged by gravity and means is provided beyond the chamber exit to guide, move, or stop the material discharged from the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:
328+, for the gravity discharge of a gated, static receptacle to one or more vehicle-mounted receivers.

217 APPARATUS FOR MOVING MATERIAL BETWEEN ZONES HAVING DIFFERENT PRESSURES AND INHIBITING CHANGE IN PRESSURE GRADIENT THEREBETWEEN:
This subclass is indented under the class definition. Apparatus comprising means to move or enable gravity movement of material from a region having a particular pressure to a region having another pressure and prevent or significantly retard any change in the pressure differential between the regions.

(1) Note. There may be one means for moving or enabling gravity movement of material and another for inhibiting pressure change, which means are separably identifiable, or there may be a means which accomplishes both functions but which does not consist of separate and distinct components or devices.

SEE OR SEARCH THIS CLASS, SUBCLASS:
805, for a process of moving material between zones having different pressures and inhibiting change in pressure gradient therebetween.

SEE OR SEARCH CLASS:

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 129+ for apparatus of that class for carrying out a reaction in which a catalyst (e.g., solid material in granular form) is employed, which apparatus may include zones of different pressures.

217.1 For carrying Standardized Mechanical Interface (SMIF) type:

This subclass is indented under 217. Subject matter in which the means to move from the pressurized regions involves the use of a specialized container or carrier designed to hold semiconductor wafers.

SEE OR SEARCH CLASS:

118, Coating Apparatus, subclass 500 for work holders or handling devices.

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclass 98 for combined subject matter.

206, Special Receptacle or Package, subclass 710 for a holder for a semiconductor wafer.

211, Supports: Racks, subclass 41.18 for a semiconductor wafer holder.

432, Heating, subclass 253 for accessory means for holding, shielding, or supporting work within furnace.

454, Ventilation, subclass 187 for clean room.

218 Including screw conveyor:

This subclass is indented under subclass 217. Apparatus wherein the moving and charge-inhibiting means includes a screw conveyor.

219 Including trap chamber having horizontal axis of rotation:

This subclass is indented under subclass 217. Apparatus wherein the moving and charge-inhibiting means includes an assembly comprising a disc- or spindle-like member having one or more pockets (e.g., recesses) in its periphery, and a housing in which the member is mounted for rotation about a horizontal axis, which assembly is located in the path of material movement for receiving, isolating and passing along a quantity of the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

189, for material supporting structure having a driven, rotatable, pocketed gate which moves material into a heating chamber.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 367+ for a dispenser having a discharge assistant in the form of a rotary conveyor-type trap chamber.

220 With means for changing pressure in trap chamber:

This subclass is indented under subclass 219. Apparatus wherein the device includes means for changing the pressure within the one or more chambers as they move between the regions.

221 Including serially arranged valves in path having a vertical component (e.g., airlocks, etc.):

This subclass is indented under subclass 217. Apparatus wherein the enabling and inhibiting means includes two or more successive valves, located in a path wherein the material moves under the influence of gravity, which cooperate one with another to receive, isolate, and release a quantity of material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

169+, and 220+, for material supporting structure having serially arranged closures which release material into a heating chamber.

SEE OR SEARCH CLASS:

406, Conveyors: Fluid Current, subclasses 62+, 124+ and 169 for air locks associated with fluid current conveyors.

222.01 APPARATUS FOR CHARGING A LOAD HOLDING OR SUPPORTING ELEMENT FROM A SOURCE, AND MEANS FOR TRANSPORTING AND PRESENTING

ELEMENT TO A WORKING, TREATING, OR INSPECTING STATION:
This subclass is indented under the class definition. Subject matter comprising means for charging a load-grasping device, load-securing (e.g., impaling, suction, etc.) structure, or load-underlying surface from a source of material supply and means to move the device, structure, or surface to, or translationally align it with, a work, treatment, or inspection station.

(1) Note. The device or structure may form all or part of the charging means if it removes an article or material from the source (i.e., a self-charging device or structure).

(2) Note. The source may be a quantity of material or a plurality of articles or may be a single, continuously replaceable article (e.g., articles supplied serially by a conveyor to the device, structure, or surface).

SEE OR SEARCH THIS CLASS, SUBCLASS:
147+, for related structure in apparatus for charging or discharging a chamber of a type utilized for a heating function.
217+, for apparatus that moves materials between zones (one or both of which may be a treatment chamber) of differing pressure gradient therebetween.
749.1, for means for moving an article in a horizontal, linear path to a particular location, which path may be within a machine. The means may also support the load.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 339.1+ for a conveyor, or a system of conveyors, which transports material to a specifically claimed work, treatment, or inspection station along its path; however, if the station is not so claimed, the conveyor or system thereof is classified elsewhere in this class (198).
269, Work Holders, subclasses 55+ for related structure not involving a source of material supply for the load holding or supporting element.
483, Tool Changing, subclasses 14+ for apparatus including tool transfer means combined with either a tool support or storage means, and further including a workpiece transfer means.

222.02 Condition responsive control of transporting means:
This subclass is indented under subclass 222.01. Subject matter including means for sensing (a) a change in the transported article or (b) a change in (a) the mode of operation of the transporting means or (b) the article-working, treating, or inspecting apparatus and in response to the change, controlling the transporting of the article or controlling the operation of the transporting means (e.g., means for stopping the transporting means if the article is not properly positioned at the station).

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclasses 500+ for electrical automatic condition responsive indicating system.

222.03 Portion of transporting means is retarded or stopped with load at station without being disconnected from remainder of transporting means:
This subclass is indented under subclass 222.01. Subject matter wherein the article and its respective supporting part of the transporting means are caused to move relative to the remainder of the transporting means such that the article advancement relative to the station is slowed or halted.

222.04 Device engages load holding or supporting element or load on element to align load at station:
This subclass is indented under subclass 222.01. Subject matter including a separate aligning means, such as a locator pin or clamp, which temporarily engage the transporting means or the article to position the article at the station.

222.05 Device engages load holding or supporting element to fix element position relative to station:
This subclass is indented under subclass 222.04. Subject matter wherein at least a portion of the supporting element is engaged by

the aligning means to position the article at the station.

222.06 Device engages portion of element which is separable from transporting means to fix position of portion of element:
This subclass is indented under subclass 222.05. Subject matter wherein a detachable part of the supporting element is engaged by the aligning means to position the load at the station.

222.07 Means to convey load back and forth between initial location and station:
This subclass is indented under subclass 222.01. Subject matter wherein the load the transporting means conveys the load holding or supporting element in both directions between the starting location and the station.

222.08 Charging transporting means with load at station:
This subclass is indented under subclass 222.01. Subject matter wherein the transporting means is receiving the load at the station.

222.09 With simultaneous charging and discharging of plural load holding or supporting elements:
This subclass is indented under subclass 222.01. Subject matter wherein the apparatus is loading and unloading a plurality of load holding or supporting elements at the same time.

222.1 With pusher:
This subclass is indented under subclass 222.09. Subject matter wherein the apparatus includes a member which exerts a horizontal force for directing the load toward the load holding or supporting elements.

222.11 With conveyor:
This subclass is indented under subclass 222.09. Subject matter wherein the apparatus includes a conveyor which moves the load to and from the load holding or supporting elements.

222.12 With reciprocating arm:
This subclass is indented under subclass 222.09. Subject matter wherein the apparatus includes an extended member which supports the load at one end and has a back and forth horizontal movement.

222.13 Transporting means carries load to at least one of a plurality of fixed stations:
This subclass is indented under subclass 222.01. Subject matter wherein the load is transported by the transporting means and presented at least to one of many stationary stations.

223.01 Supply source capable of 360 degrees revolution:
This subclass is indented under subclass 222.01. Subject matter wherein the source of material supply can rotate up to 360 degrees about a support axis.

223.02 Supply source capable of reversible 180 degrees revolution:
This subclass is indented under subclass 222.01. Subject matter wherein the source of material supply can rotate only up to 180 degrees about a support axis and is capable of turning back its position or direction.

224.01 Supply source includes chute:
This subclass is indented under subclass 222.01. Subject matter wherein the source of material supply comprises an inclined trough vertically higher on its input end than its exhaust end for transportation of material therealong by gravity.

225.01 Load holding or supporting element including gripping means:
This subclass is indented under subclass 222.01. Subject matter wherein the load holding or supporting element includes load engaging members to grasp the load.

226.01 Plural grippers for plural elements:
This subclass is indented under subclass 225.01. Subject matter which includes more than one load gripping means for more than one load holding or supporting elements.

226.02 Gripper includes pivoted jaw:
This subclass is indented under subclass 225.01. Subject matter wherein at least one of the two load engaging members is pivotally mounted.

SEE OR SEARCH CLASS:

269, Work Holders, subclasses 86+ for work engaging and holding structure comprising movable jaws.

226.03 Including plurality of supply sources for single element:

This subclass is indented under subclass 222.01. Subject matter wherein more than one supply sources are provided for only one load holding or supporting element.

226.04 Device engaging transporting means or source to align element relative to source:

This subclass is indented under subclass 222.01. Subject matter which includes a member which engages the load holding or transporting means or the supply source to position the transporting means at a specific location relative to the supply source.

226.05 Transporting means is a horizontally rotated arm:

This subclass is indented under subclass 222.01. Subject matter wherein the load transporting means includes a projecting member which supports the load at one end and turns about its vertical axis.

227 APPARATUS PARTICULARLY ADAPTED FOR CHARGING OR DISCHARGING A FACILITY COMPRISING ONE OR MORE SITES FOR THE PARKING OF WHEELED VEHICLES:

This subclass is indented under the class definition. Apparatus comprising means for carrying, moving, placing, transporting, etc., one or more wheeled vehicles from, in, into, on, onto, off from, out of, within, etc., a facility where it may be allowed to remain for a period of time. The facility may comprise only a site for parking one vehicle, or it may involve a plurality of parking sites; in the latter case, in particular, it may include building structure (e.g., as in a parking garage). Any parking site, or any or all of a plurality of such sites, may be either (a) fixed in nature, or (b) of a kind which is occasionally or frequently subjected to being moved bodily (e.g., orbitally, laterally displaced, etc.).

(1) Note. "Site", as used hereinafter, shall be understood to mean parking site.

SEE OR SEARCH CLASS:

52, Static Structure (e.g., Buildings), subclasses 174+ for a structure of that class which may include means peculiar to the direction or control of vehicular, surface traffic.

410, Freight Accommodation on Freight Carrier, subclasses 4+ for the accommodation of a vehicle on a vehicle-transporting carrier of that class.

296, Land Vehicles: Bodies and Tops, subclass 101 for the accommodation of a vehicle on a vehicle-transporting carrier of that class.

228 Facility includes structure (e.g., ramp, angularly related successive locations for a vehicle, etc.) necessitating self-propellability or steerability of vehicle:

This subclass is indented under subclass 227. Apparatus wherein the facility is so constructed as to require that a vehicle, which is to move or be moved from one location to another at or in the facility, have a capability for propelling itself and/or of being steered.

(1) Note. While it is commonplace in the parking facility art, usually as a matter of convenience or expediency, to drive a vehicle onto or off from a site, this and the indented subclasses are limited to providing only for those facilities which are so constructed that some or all of the movement of a vehicle is possible only if the vehicle possesses one or more capabilities of the nature described. In other words, this subclass does not extend to include a mere forward or backward movement of a vehicle on a level surface because movement of that nature may be accomplished manually if necessary.

(2) Note. A patent is proper for original placement here if there is any suggestion in the claims of structure which necessitates self-propellability, etc., on the part of the vehicle.

(3) Note. A patent is properly cross-referenced here when it is clear that, in spite of the absence of structure for this subclass, an intention exists that an operator remain with the vehicle during at least a

portion of the time while it is being moved to or from a site.

229 Upwardly inclined, pivotable parking site for receiving driven vehicle:
This subclass is indented under subclass 228. Apparatus wherein the facility includes a site which comprises an upwardly inclined, pivotably mounted surface along which a vehicle moves under it own power. The axis of pivot is horizontal and is perpendicular to the direction of travel of the vehicle.

(1) Note. Occasionally the purpose of making the site pivotable is to create space therebeneath for the parking of another vehicle.

230 Caused to pivot by advancing vehicle:
This subclass is indented under subclass 229. Apparatus wherein the site pivots as a result of the movement of a vehicle along the surface thereof from a point on one side of the axis of pivot to a point on the opposite side thereof.

231 With control system responsive to changeable operating instructions:
This subclass is indented under subclass 227. Apparatus provided with a system for controlling the movement of a vehicle to or from a site, which system has a capacity for accepting, comprehending, and responding to delivery, retrieval, etc., instructions which are of a variable nature.

(1) Note. The concept of this subclass is that of a control system which, as a minimum, is capable of accepting (by code or otherwise) the designation of a site, analyzing the location thereof, selecting a route thereto, causing a vehicle moving means to follow that route and either deposit or pick up a vehicle upon reaching the site, and then causing the moving means to return to its usual locus for receiving incoming vehicles or discharging outgoing ones, or to an alternative locus if so ordered.

SEE OR SEARCH THIS CLASS, SUBCLASS:
252, for a related but generally less complex system wherein the moving means, upon command, transports the vehicle along a predetermined route to a specified destination, and particularly, see (1) Note and (2) Note thereof.

232 With means to sense condition of site:
This subclass is indented under subclass 227. Apparatus provided with means for investigating a site to determine its status (i.e., occupied or unoccupied) or any other characteristic thereof pertinent to its suitability for receiving a vehicle.

233 Including one or more movable sites:
This subclass is indented under subclass 227. Apparatus wherein the facility includes at least one site which comprises a movable, vehicle-supporting device or element to which an incoming vehicle moves, or is moved, and on which the vehicle remains during its stay, or the predominant portion thereof, at the facility. The site and its vehicle may move frequently relative to the facility (e.g., to permit the receipt or discharge by the facility of other vehicles), or their movement may be only that necessary for the site to move its vehicle to the specific location which they will occupy and to return it therefrom.

(1) Note. The following observations may be made concerning the movable site concept: (a) the phrase “device or element” embraces structures ranging from a driven carrier (e.g., conveyor, elevator, etc.) to a single supporting member (e.g., dolly, platform, pallet, etc.) so long as it is susceptible of moving, or being moved, while supporting a particular vehicle which will remain thereon for most of its stay at the facility; (b) a movable site most frequently, but not always, is located on a translatably movable transporting member of one kind or another. Such a transporting member may be (1) a carrier which receives a single vehicle and which has some degree of independence of movement, as provided for in subclasses 236+ below, or (2) a plural-vehicle-accommodating carrier (e.g a conveyor), certain ones of which are provided for in subclasses 242+ below, and see the definition of that subclass for certain arbitrary distinc-

tions as to what constitutes a movable site therefor.

234 Vehicle assigned to particular supporting member (e.g., platform, dolly, cage, etc.) having some degree of independence either as to means, time or direction of movement:
This subclass is indented under subclass 233. Apparatus wherein a movable site comprises a member which receives one vehicle and forms the supporting element on which it rests during all or a predominant portion of its stay in or at the facility, and which member exhibits a degree of independence, as evidenced, for instance, by (a) being carried by a transporting device, or driven by an external means, but being separable or detachable from either one to follow another path or remain stationary, (b) having its own drive means and moving independently in a prescribed path or at random or remaining at rest, or (c) otherwise exhibiting a degree of independence of time or direction of movement.

(1) Note. A separate supporting member of the kind contemplated by subclass 239 below, but intended for manual movement and therefore lacking the drive means required for that subclass (239), is found here.

235 Supporting member separable from endless, member-transporting carrier, or disengageable from endless drive means, and movable away therefrom for receiving, discharging or storing vehicle:
This subclass is indented under subclass 234. Apparatus wherein at least one supporting member is transported by an endless carrier, or is driven by an endless drive means, and is separable, or disengageable, respectively, therefrom for moving apart to a location at which it may receive or discharge a vehicle or to a fixed site where it and the vehicle will remain.

236 Plurality of supporting member moved in recirculating fashion by succession of driving devices:
This subclass is indented under subclass 234. Apparatus wherein a plurality of supporting members are moved in a single, fixed path, or in a plurality of paths which share a common origin and terminus, and wherein the means for moving the member comprises a plurality of successively arranged driving devices.

(1) Note. The successively arranged driving devices may be powered from a single source.

237 Path of moving member describes generally rectangular loop:
This subclass is indented under subclass 236. Apparatus wherein the members move in a path which comprises a loop having two pair of opposite, parallel sides, one pair of which ordinarily is significantly greater in length than the other pair.

238 Successive devices each include endless, member-driving element (e.g., belt, cable, chain, etc.):
This subclass is indented under subclass 237. Apparatus wherein each of the successive driving devices includes an endless belt, cable, chain, etc., which engages and moves the member.

239 One or more separate supporting members and means to impart independent, linear or partly linear, movement thereto:
This subclass is indented under subclass 234. Apparatus comprising at least one separate member for receiving and supporting a single vehicle and means to move any or all such members in an independent manner and in a path which is, at least in part, linear in direction.

(1) Note. The moving means may be a self-contained drive means, or it may be an external drive means; if there are a plurality of supporting members, an external drive means moves only one member at a time.

(2) Note. See (1) Note of subclass 234 above.

240 Member moving from particular location to discharge and/or receive vehicle, and returning thereto:
This subclass is indented under subclass 239. Apparatus wherein a member is associated with a specific location in the facility and occupies that location when supporting a parked vehicle, the member leaving that location only

to obtain a vehicle which is to be parked on it or to deliver such a vehicle.

241 With means to transfer vehicle to or from supporting member:
This subclass is indented under subclass 234. Apparatus wherein means is provided for moving a vehicle to or from a supporting member.

242 On driven, plural-site carrier initially receiving vehicle:
This subclass is indented under subclass 233. Apparatus wherein a movable site comprises any vehicle accommodating space on a driven carrier which is in excess of the space required for the carrier to transport a single vehicle, and wherein the carrier is the one to which the vehicle moves, or is moved, upon arriving at the facility.

(1) Note. Vehicle accommodating platforms attached to an endless drive member, or mounted on a rotatable wheel, obviously constitute movable parking site. Less clear, however, is the case of, for instance, a two-, three-, four-car, vertically and/or horizontally driven, carrier; while such a carrier frequently is intended to transport only one vehicle at a time, and often does only that, the fact that it is common practice in the parking facility industry to utilize, when operating at or near the capacity of the facility, all available vehicle-accommodating space therefore necessitates treating any space in excess of that required for one vehicle as a movable site, since a corresponding number of vehicles may be left thereon for as long a period as desired.

243 With loading means, external to carrier, at facility entrance:
This subclass is indented under subclass 242. Apparatus wherein means which does not form a part of the structure of the initial carrier, is provided at or near the entrance to the facility for the purpose of moving (e.g., transferring) a vehicle to or from the initial carrier.

244 Serving also movable site on subsequent driven carrier, or fixed site:
This subclass is indented under subclass 242. Apparatus wherein the driven, plural-site, initial carrier functions also to transport a vehicle to (a) a movable site on a driven carrier which is located beyond the initial carrier, or (b) a fixed site.

245 By moving linearly in a horizontal direction:
This subclass is indented under subclass 244. Apparatus wherein the initial carrier moves along a path which is represented by a horizontal line.

(1) Note. The movement of this subclass often is of a reciprocatory nature.

246 And moving vertically (e.g., laterally shiftable elevator, etc.):
This subclass is indented under subclass 245. Apparatus wherein the initial carrier moves vertically as well as horizontally.

247 By moving linearly in vertical direction or orbiting in vertical plane:
This subclass is indented under subclass 244. Apparatus wherein the initial carrier moves either along a path which is represented by a vertical line or in a closed path which lies in a vertical plane.

248 Endless carrier having sites attached thereto (e.g., suspended therefrom, etc.):
This subclass is indented under subclass 247. Apparatus wherein the initial carrier comprises an endless drive means having one or more sites attached to it.

(1) Note. The sites may be attached between a pair of spaced, parallel, endless drive means, but frequently are suspended from a single such means.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 793+ for a surface for conveying a unit load and means for driving the surface about an endless path.

249 Moving linearly in vertical direction or orbiting in vertical plane:
This subclass is indented under subclass 242. Apparatus wherein the driven, plural-site, initial carrier moves either along a path which is represented by a vertical line or a closed path which lies in a vertical plane.

250 Revolving about single, horizontal axis:
This subclass is indented under subclass 249. Apparatus wherein the initial carrier orbits in a circular path which has, as its center, a horizontal line.

251 Endless carrier having sites attached thereto (e.g., suspended therefrom):
This subclass is indented under subclass 249. Apparatus wherein the initial carrier comprises an endless drive means having one or more sites attached to it.

(1) Note. (1) Note of subclass 248 applies similarly here.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 793+ as explained in subclass 248 above.

252 With vehicle storage or retrieval system responsive to manual designation of destination:
This subclass is indented under subclass 227. Apparatus provided with a system having means for manually specifying (i.e., by an operator) a particular site to which a vehicle is to be moved, either for the storage or the retrieval thereof, and for moving a vehicle thereto or therefrom over a route which usually (but see (1) Note) is predetermined and not subject to variation.

(1) Note. The concept of this subclass is that of, for example, sequencing circuitry which, when energized (e.g., by closing a switch), causes the vehicle-moving apparatus to respond by moving the vehicle in a predetermined path to a particular, nonchangeable destination. (A system of this nature is sometimes described in the art as an "automatic" one).

(2) Note. The ability of a system to select the shortest one of plural, alternative routes to or from a site is considered to be within the capabilities of an apparatus of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
231, for a control system which has a capacity for responding to changeable operating instructions.

253 With means to transfer, or facilitate transfer of, vehicle from carrier to site or vice versa:
This subclass is indented under subclass 227. Apparatus wherein means is provided to move a vehicle from a carrier to a site or from a site to a carrier, or, in the alternative, a means which does not in itself accomplish the movement of the vehicle, but which enables such movement to be performed more easily, more readily, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
241, for means to transfer a vehicle to or from a movable site wherein the site comprises a supporting member which receives and stays with a particular vehicle.
243, for means to transfer a vehicle to or from a movable site, which site is on an initial, receiving, driven carrier, and wherein the means is located at the entrance to the facility, externally of the carrier.

254 Including sets of intermeshing support elements having relative vertical movement:
This subclass is indented under subclass 253. Apparatus wherein the transfer means includes interacting sets of spaced, load-supporting elements (i.e., fingers), the elements of one set being so aligned with and related to the elements of the other set that a vehicle which is resting on one set will pass to the other set upon vertical movement of one set relative to the other set.

255 By exerting upward, in addition to generally horizontal, force:
This subclass is indented under subclass 253. Apparatus wherein the transfer means moves a vehicle by utilizing not only a lateral force, but also a lifting force.

256 And forming sole support for vehicle:
This subclass is indented under subclass 255. Apparatus wherein the transfer means accepts the entire weight of the vehicle.

257 Complementary, driven, vehicle-supporting conveyors on carrier and site:
This subclass is indented under subclass 253. Apparatus wherein the transfer means comprises at least one driven conveyor located on each of a carrier and a site, which conveyors cooperate in supporting and moving a vehicle from one to the other.

258 Tiltable or inclined means for supporting vehicle, on carrier or site:
This subclass is indented under subclass 253. Apparatus wherein the transfer or transfer-facilitating means comprises a carrier- or site-located means for supporting the vehicle, which means is either (a) movable into a position where it is inclined with respect to the horizontal (and hence to the carrier or site), or (b) formed in such a manner as to be so inclined; in either instance, the resultant inclination of the vehicle gives it the inherent capability of moving relative to its support.

(1) Note. The supporting means, particularly in (b) above, may be an integral portion of the carrier or site.

259 By exerting generally horizontal force:
This subclass is indented under subclass 253. Apparatus wherein the transfer means moves the vehicle by applying thereto (e.g., by push-pull device) a lateral force.

(1) Note. The movement of a vehicle by the application of a force of the nature contemplated by this subclass ordinarily requires that the wheels of the vehicle be free to turn.

260 Comprising component of carrier having both horizontal and vertical paths of travel:
This subclass is indented under subclass 259. Apparatus wherein the transfer means travels with and operates from a carrier which undergoes movement in at least one horizontal path and at least one vertical path while supporting one or more vehicles.

(1) Note. The carrier on which the means is located may be an auxiliary component of another carrier (e.g., the other carrier is a vertically moving elevator and the carrier having the transfer means travels therewith in a vertical direction and departs therefrom to move horizontally), in which instance it is the auxiliary carrier which fulfills the requirement of this subclass.

261 Carrier-facility-site relationship:
This subclass is indented under subclass 227. Apparatus involving an operational, physical, spatial, or structural interrelationship of any of a carrier or a facility or a site to one or more of the other entities.

262 Route to site utilizes plural carriers:
This subclass is indented under subclass 261. Apparatus wherein a vehicle, during the course of its movement either to or from a site, is transported on or by at least two, different carriers.

SEE OR SEARCH THIS CLASS, SUBCLASS:
260, for a plural carrier arrangement which is described in (1) Note of that subclass.

263 Sites arranged radially of carrier rotatable in whole or in part:
This subclass is indented under subclass 261. Apparatus wherein the sites of a facility are arranged in peripheral relationship to a carrier, which carrier, or a component thereof, is movable about a vertical axis which passes through the carrier.

(1) Note. The carrier frequently is movable in a vertical direction, also, and, in some such instances, may undergo both kinds of movement simultaneously.

264 Sites arranged in superposed, longitudinal rows and in confronting relationship to carrier in intervening aisle:
This subclass is indented under subclass 261. Apparatus wherein two, spaced-apart groups of sites face each other across a passageway, each group having rows of sites which extend both horizontally and vertically along the passage-

way, and wherein at least one carrier is located in the passageway.

(1) Note. The type of carrier most commonly found here is capable, in many instances, of being driven both horizontally and vertically at the same time, thus imparting to a vehicle being carried thereby a movement which is "diagonal" relative to the confronting rows of sites.

265 GUIDED, WHEELED DEVICE FOR TRANSPORTING MAIL AND EXTERNAL MEANS CO-OPERATING THEREWITH FOR LOADING OR UNLOADING THE DEVICE:

This subclass is indented under the class definition. Apparatus comprising a wheeled, mail transporting device and structure (e.g., tracks, cable, etc.) to guide the device to a mail collection and/or delivery station where it loads or unloads the mail with the assistance of an external means.

(1) Note. The patents of this subclass, subclass 39 of former Class 214, involve subject matter in which there has been no activity in recent years. Accordingly, the subclass has merely been relocated to a point where the art can be kept intact.

266 PLURAL STATIC STRUCTURES FOR SUPPORTING DISCRETE LOADS AND CHARGING OR DISCHARGING MEANS THEREFOR:

This subclass is indented under the class definition. Apparatus comprising a plurality of charge-supporting elements or charge-holding receptacles, which elements or receptacles are of a static (e.g., fixed, stationary, etc.) nature, and means for moving a charge toward, to, onto, into, from, away from, off, out of, etc., each of the elements or receptacles.

(1) Note. Elements or receptacles which remain in a particular location, but which include means for moving (e.g., rotatably driving) them while in that location, as well as means for charging or discharging them, are classified elsewhere in this class (e.g., subclass 787).

(2) Note. To be proper for the plural receptacles of this subclass, charges must be supported by the receptacles, not merely transported therewith or therethrough, and transferred from the charging means to the receptacles or from the receptacles to the discharging means.

(3) Note. Charge-supporting elements or charge-holding receptacles which are disclosed as being portable, but for which neither movement nor means to allow movement (e.g., wheels, vehicle mounted, conveyor mounted, etc.) is claimed, are treated as being static.

SEE OR SEARCH THIS CLASS, SUBCLASS:

331.01+, for the charging or discharging, by an external means, of a movable rack having superposed, charge-supporting elements.

807, for a process of charging or discharging plural static structures for supporting discrete loads and utilizing charging or discharging means therefor.

267 Load-underlying members (e.g., racks, receptacles (or a compartmented receptacle), shelves, troughs, etc.):

This subclass is indented under subclass 266. Apparatus wherein the plural structures comprise members which contact the discrete charges from below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

288+, for the combination of plural receptacles and plural charging or discharging means therefor, but wherein each receptacle is charged or discharged solely by a particular one of the means.

SEE OR SEARCH CLASS:

100, Presses, subclass 196 for presses with plural pairs of opposing pressure surfaces, which surfaces are relatively movable to compress material therebetween, and having means for placing the material thereon or removing it therefrom.

406, Conveyors: Fluid Current, subclasses 117+ and 155+ for a fluid current conveyor having plural inlets and plural outlets, respectively.

268 With means for selectively charging a plurality of receptacles from a single source, or selectively discharging a plurality of receptacles to a single destination:
This subclass is indented under subclass 267. Apparatus wherein the load underlying members comprise receptacles and wherein means is provided whereby (a) a plurality of receptacles may be charged selectively (e.g., one at a time in such order as may be chosen) from one source of material, or (b) a plurality of them may be discharged selectively to one destination.

269 Charging a plurality of receptacles:
This subclass is indented under subclass 268. Apparatus wherein the means is particularly adapted for charging a plurality of receptacles from a single source. 406, Conveyors: Fluid Current, subclasses 1+ for selective delivery.

270 Condition responsive:
This subclass is indented under subclass 269. Apparatus wherein means is provided to sense a condition of the selective charging means, or the material, or one or more of the receptacles during the charging thereof, and additional means is provided to respond to the information obtained by the first means by initiating action on the part of the selective charging means to correct or otherwise change the existing condition if it is other than the desired or intended one.

SEE OR SEARCH CLASS:
406, Conveyors: Fluid Current, subclasses 3+ for condition-responsive selective delivery.

271 By driven conveyor having gated discharging locations spaced therealong:
This subclass is indented under subclass 269. Apparatus wherein the means comprises a driven conveyor having a plurality of individually controllable outlets along its length, the location of each outlet corresponding with a charge-receiving opening of one receptacle of the plurality thereof.

272 By conveyor movable (e.g., pivotable, etc.) to reposition outlet thereof:
This subclass is indented under subclass 269. Apparatus wherein the means comprises a conveyor, of a driven or a gravity type, which is so mounted that its discharge region may be moved (e.g., by swinging about an axis located in another region of the conveyor) to any particular one of a number of different discharge points, which points are each represented by the charge-receiving opening of one receptacle of the plurality thereof.

273 With control system responsive to changeable operating instructions:
This subclass is indented under subclass 267. Apparatus wherein a system is provided for controlling the charge moving means, which system has a capacity for accepting, comprehending, and responding to instructions which are of a varying or variable nature.

(1) Note. The concept of this subclass does not extend to include what is sometimes referred to as an "automatic" operation of the charge moving means; that is, the provision of a particular circuit, which is sequenced or programmed to always produce the same predetermined movement of the means to a particular destination, is not sufficient for inclusion herein.

(2) Note. To be proper for this subclass, a system should be capable of, as a minimum, accepting (by code or otherwise) the designation of a destination, selecting a route for, and causing the means to move to, that destination, depositing thereat, or picking up therefrom, a charge, and returning to its original location--or to an alternative location if so ordered. Further refinements of such a system might include (a) investigating, on the part of the means, of the status of its destination and, if found to preclude the execution of its mission, requesting an alternative destination, (b) as in (a) but the assumption by the means of the responsibility for finding a suitable alternative destination, etc., or (c) identifying a particular article among a plurality of articles and retrieving that article.

(3) Note. As long as a system for (2) Note is disclosed, the claiming of a specific component thereof is sufficient for classification here.

274 With means on charging or discharging means to determine status of member:
This subclass is indented under subclass 273. Apparatus which has means located on the moving means for investigating the availability of the member.

275 With means to detect obstruction and alter movement of charging or discharging means:
This subclass is indented under subclass 273. Apparatus with means for determining whether the path of the charge will cause undesired contact with an object (e.g., because of the path being blocked by a misaligned charge, because of improper clearance with a load-underlying member, etc.), and for altering the motion of the moving means to avoid, or to minimize the effect of, such contact.

276 Inclined members:
This subclass is indented under subclass 267. Apparatus wherein the member is inclined and controllably retains the charge (e.g., gated gravity flow path).

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 347.1+ for a conveyor system including at least two conveyor sections for moving a load between a source and a destination and having, located between those sections, one or more auxiliary conveyor sections for temporarily storing items, which auxiliary sections may be of the gravity flow path type.

277 Charging or discharging means includes load-sustaining surface and device to transfer load, with horizontal component of movement, from or to surface or member:
This subclass is indented under subclass 267. Apparatus wherein the charge moving means includes a charge sustaining surface and a device to transfer, with a horizontal component of motion, the charge from or to the member.

(1) Note. The charge sustaining surface and the transfer device may consist of separate structures (e.g., a movable rack and a pusher car).

278 Device comprises one or more conveyors of driven roller or endless apron type:
This subclass is indented under subclass 277. Apparatus wherein the transfer device comprises one or more conveyors of the driven roller or endless apron type which form part of the surface or the member.

279 Device includes self-powered, track-guided car:
This subclass is indented under subclass 277. Apparatus in which the transfer device includes a self-powered vehicle which travels on and is guided by tracks which are located on the surface and the member.

280 Device includes push-pull mechanism:
This subclass is indented under subclass 277. Apparatus wherein the transfer device includes driven means to push or pull a charge from or to the surface or the member.

281 Charging or discharging means includes elevating device, movable in horizontal direction (e.g., portable, etc.), having load-sustaining surface:
This subclass is indented under subclass 267. Apparatus wherein the charge moving means is a device for raising and lowering a charge-sustaining surface, which device is movable horizontally from one location to another.

282 Including additional means to move surface horizontally relative to device:
This subclass is indented under subclass 281. Apparatus and including additional means to impart another component of horizontal movement to the surface, which component consists of movement relative to the device.

283 Pivotably or rotatably:
This subclass is indented under subclass 282. Apparatus in which the other component of horizontal movement comprises pivotable or rotatable displacement.

284 With detachably associated auxiliary carrier for transporting device during portion of its horizontal travel:
This subclass is indented under subclass 281. Apparatus in which the shiftable raising and lowering device is carried along part of its horizontal travel by a separable, device-supporting means (e.g., interaisle transfer car).

285 Charging or discharging means comprises plural endless conveyors or plural runs of single endless conveyor:
This subclass is indented under subclass 267. Apparatus in which the charge moving means includes plural endless conveyors or plural runs of a single endless conveyor.

286 With load-supporting pallet:
This subclass is indented under subclass 267. Apparatus including a movable charge-supporting device in the nature of a platform (e.g., a pallet), which platform is transferred by the moving means to and from the member.

SEE OR SEARCH CLASS:
108, Horizontally Supported Planar Surfaces, subclasses 51.11+ for an industrial platform (e.g., a pallet or skid adapted to receive handling means).
206, Special Receptacle or Package, subclasses 386+ for a container of that class provided with a pallet feature.

287 STATIC RECEPTACLE OF A MATERIAL CONDITIONING TYPE AND MEANS TO MOVE, OR FACILITATE MOVEMENT OF, MATERIAL TO, WITHIN, OR FROM THE RECEPTACLE:
This subclass is indented under the class definition. Apparatus comprising a fixed or stationary chamber (e.g., bin, vessel, container, receptacle, etc.) of a kind associated with an operation involving the treating of material, and either charge moving means, or charge-movement-related structure, for moving, or facilitating the movement of, a charge of material to, within, or from the chamber, which combination is not properly classifiable elsewhere (e.g., in the relevant treatment class).

(1) Note. An example of the art found herein is a bin and a charging means therefor, which bin is intended to be used, at least in part, for the drying of grain and therefore is provided with structure enabling the passage of air.

(2) Note. If a means to treat material is present, classification is in the appropriate treating class.

SEE OR SEARCH THIS CLASS, SUBCLASS:
217+, for apparatus that moves material between zones (one or both of which may be a treatment chamber) of differing pressures and inhibits changes in the pressure gradient therebetween.
222.01+, for related structure, but wherein is additionally provided means for charging a load holding or supporting element from a source of material or articles.

288 STATIC RECEPTACLE AND MEANS FOR CHARGING OR DISCHARGING, OR FACILITATING THE CHARGING OR DISCHARGING OF, THE RECEPTACLE:
This subclass is indented under the class definition. Apparatus comprising a charge-holding receptacle which is of a fixed or stationary nature (e.g., a bin, silo, tank, etc.) and either charge-moving means, or charge-movement-related structure, for moving, or facilitating the movement of, a charge of material to or from the receptacle, and wherein the purpose of the movement is to charge or discharge material to or from the receptacle.

(1) Note. A receptacle which remains in a particular location, but which includes means for moving (e.g., rotatably driving) it while in that location, as well as means for charging or discharging it, is classified elsewhere in this class (e.g., subclass 787).

(2) Note. To be proper for this subclass, a charge must be supported by the receptacle, not merely transported therewithin or therethrough, and transferred from the charging means to the receptacle or from the receptacle to the discharging means.

(3) Note. A receptacle which is disclosed as being portable, but for which neither movement nor means to allow move-

ment (e.g., wheels, vehicle mounted, conveyor mounted, etc.) is claimed, is treated as being static.

(4) Note. Where the combination of a tank or vat disclosed for holding liquids is claimed in combination with means for introducing and/or removing work therefrom for contacting the work with the liquids, classification is not in this class (414), but in some other class, of which Class 134, Cleaning and Liquid Contact With Solids, is the generic class. The notes to Class 134 set out the various classes having the noted combination.

(5) Note. See (2) Note of the definition of subclass 104.05, in Class 15, Brushing, Scrubbing, and General Cleaning, for the line as to devices for removing the hardened material from retorts or other chambers, and for the classification where the device for removing hardened material is claimed as permanently associated with the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

267+, for the combination of a single receptacle which is divided into plural compartments and means for charging or discharging the compartments.

808, for a process of charging or discharging, or facilitating the charging or discharging of a static receptacle.

SEE OR SEARCH CLASS:

15, Brushing, Scrubbing, and General Cleaning, subclasses 104.05+ for devices for scraping or cutting material from the interior of a pipe. See (5) Note above.

99, Foods and Beverages: Apparatus, subclasses 360 through 366 for a conveyor designed to receive food, a food article or a beverage containing receptacle, and having a heat generator, a heat exchanger, other means physically effecting the food or beverage during the conveying, or an enclosure or tank having more than enough structure for the operation of the conveyor.

134, Cleaning and Liquid Contact With Solids, appropriate subclasses. See (4) Note above.

222, Dispensing, appropriate subclasses, and see subclass 166 for a dispenser which is tiltable to discharge its contents by gravity, and subclasses 608+ for a dispenser having a casing or a support which is ambulatory.

378, X-Ray or Gamma Ray Systems or Devices, appropriate subclasses for electron microscopes having means for inserting a specimen into the evacuated champer of the microscope without destroying the vacuum.

406, Conveyors: Fluid Current, appropriate subclasses for the combination of a fluid current conveyor and a receptacle.

289 With alarm, indicator, or signal:

This subclass is indented under subclass 288. Apparatus wherein the receptacle or the charge-moving or charge-arranging means includes means to sense a condition therein or thereof and to react thereto by providing an indication of the status of the condition sensed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

148, for the combination of an alarm, indicator, or signal responsive to a sensing means in a system involving a chamber of the type utilized for a heating function and a charging or discharging means therefor.

SEE OR SEARCH CLASS:

116, Signals and Indicators, appropriate subclasses for an alarm, indicator, or signal of a mechanical nature.

340, Communications: Electrical, appropriate subclasses for an alarm, indicator, or signal of an electrical nature.

290 Receptacle contains liquid in which charge is submergibly sealed:

This subclass is indented under subclass 288. Apparatus wherein the receptacle contains liquid in which the charge is submerged to form a liquid seal around the charge to protect the atmosphere from the charge or vice versa.

291 With means to handle (e.g., recirculate, remove, etc.) dust:
This subclass is indented under subclass 288. Apparatus wherein the receptacle includes means to dispose of or otherwise manage dust created incident to a loading or an unloading operation.

292 With means to seal receptacle in vicinity of entrance for charging or discharging means:
This subclass is indented under subclass 288. Apparatus wherein the receptacle or the charge-moving means is provided with means to tightly join the charge-moving means to that region of the receptacle through which it passes.

293 Charging or charge-distributing means:
This subclass is indented under subclass 288. Apparatus comprising means for either (a) moving a charge into a receptacle, (b) facilitating the charging by arranging or rearranging the charge within the receptacle, or (c) performing both functions.

(1) Note. "Charging" and "charge-distributing" means frequently are not readily distinguishable from one another, either structurally or functionally, and therefore are treated together in this and the indented subclasses.

294 Condition responsive:
This subclass is indented under subclass 293. Apparatus wherein means is provided to sense a condition of the receptacle, or the charge-moving or charge-arranging means, or the charge during a charging or a distributing operation, and additional means is provided to respond to the information obtained by the first means by initiating action on the part of the charge-moving or charge-arranging means to correct or otherwise change the existing condition if it is other than the desired or intended one.

SEE OR SEARCH THIS CLASS, SUBCLASS:
161, for the combination of a chamber of the type utilized for a heating function and charging or discharging means therefor, and wherein the combination includes a control system for responding to a condition which exists in the chamber.

295 Position of charging means controlled by level of material in receptacle:
This subclass is indented under subclass 294. Apparatus wherein the condition sensed is the level (i.e., the height) of the material in the receptacle, and the additional means comprises a device for repositioning the charge-moving or charge-arranging means in accordance therewith (e.g., for the purpose of maintaining the level of material uniform throughout the receptacle).

296 Drive means of charging conveyor controlled by level of material in receptacle:
This subclass is indented under subclass 294. Apparatus wherein the condition sensed in the level (i.e., the height) of the material in the receptacle, and the additional means comprises a device for controlling (e.g., starting, stopping, etc.) the driving arrangement of a charging means in the form of a conveyor (e.g., for the purpose of regulating the level of the material in the receptacle).

297 With means to ream or cut, or with collapsible means to form, vertical discharge passage in material during charging:
This subclass is indented under subclass 293. Apparatus wherein means is provided to form a vertical opening through the material being loaded while its level is rising in the receptacle, which opening subsequently will serve as a discharge route for the material, the means comprising either (a) a means to remove or displace the material and thereby form a self-sustaining hole therein, or (b) a self-erecting or manually erected conduit to form a walled hole in the material, which conduit collapses or is otherwise removed as the level of material falls during an unloading operation.

298 Serving also to discharge receptacle:
This subclass is indented under subclass 293. Apparatus wherein either the charge-moving means or the charge-arranging means acts also upon the charge to move it from the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
150+, for means for charging a chamber of a type utilized for a heating function,

which means also serves to discharge the chamber.

299 Terminal portion of means comprises gravity flow path (e.g., chute, etc.):
This subclass is indented under subclass 293. Apparatus wherein either the moving means or the movement-related structure includes, at and/or immediately preceding its discharge outlet, material supporting and/or guiding structure in the nature of a gravity conveyor (e.g., a chute).

SEE OR SEARCH CLASS:
193, Conveyors, Chutes, Skids, Guides, and Ways, appropriate subclasses for specific chute structure.

300 Having charge distributing means of driven type:
This subclass is indented under subclass 293. Apparatus wherein the material arranging or rearranging means is provided with a means for driving it.

SEE OR SEARCH THIS CLASS, SUBCLASS:
205, and 206, for the combination of a chamber of a type utilized for a heating function and means for distributing material within the chamber.

301 Rotary type:
This subclass is indented under subclass 300. Apparatus wherein the material arranging or rearranging means comprises an element, member or device which is rotatable about an axis for the purpose of scattering or otherwise spreading, including leveling the surface of, material which already is present therein.

SEE OR SEARCH CLASS:
239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 650+ for a container for nonfluid material and scattering means therefor.

302 Having one or more conveyors rotatable about a vertical axis at an end thereof:
This subclass is indented under subclass 301. Apparatus wherein the rotary means comprises at least one driven conveyor, which conveyor is also driven in a traversing direction, whereby it is caused to rotate bodily about a vertical axis at one of its ends.

303 Charging a static receptacle by gravity flow from a portable load carrier:
This subclass is indented under subclass 293. Apparatus wherein the charging means includes a portable charge carrier (e.g., a vehicle-mounted container) from which the charge is transferred by gravity from the carrier to the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
192, for charging a chamber of a type utilized for a heating function by gravity flow from a carrier-mounted, tiltable receptacle.

304 Nongravity discharging means:
This subclass is indented under subclass 288. Apparatus comprising means for moving (e.g., pushing, pulling, carrying, etc.) a charge from a receptacle by a force other than that of gravity.

SEE OR SEARCH THIS CLASS, SUBCLASS:
209+, for the combination of a chamber of the type utilized for a heating function and a driven device for discharging it.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 550.01 for a receptacle-like member (e.g., bin, tank, etc.) having therein or thereon a driven conveyor for the purpose of discharging material contained in the receptacle. [At such time as the overlapping projects involving these two classes (198 and 414) are completed, it will be possible to resolve the conflict which apparently exists between the subject matter of this subclass (304) and that of subclass 550.01 of Class 198].
222, Dispensing, appropriate subclasses, especially subclasses 251+ for a dispenser having a discharge assistant.

305 Including at least one discharge assistant of the compound motion type:
This subclass is indented under subclass 304. Apparatus wherein the charge-moving means includes one of more devices for moving the

charge from the receptacle, at least one of which devices comprises a driven, material-transporting carrier (e.g., a conveyor), which carrier is driven also in a displaceable manner (e.g., pivotably, translatably, etc.) relative to the receptacle for the purpose of increasing its effectiveness for removing material therefrom.

306 Having compound motion assistant located proximate to bottom of receptacle and displaceable generally parallel thereto:

This subclass is indented under subclass 305. Apparatus wherein a compound motion discharge assistant is located near the bottom of the receptacle, is driven displaceably in a direction more or less parallel to the bottom, and initiates the moving of the charge from the receptacle by acting upon the lower portion of the charge.

307 Condition responsive:

This subclass is indented under subclass 306. Apparatus wherein means is provided to sense a condition of the receptacle, or the charge-moving means, or the charge during a discharging operation, and additional means is provided to respond to the information obtained by the first means by initiating action on the part of a bottom-located discharge assistant to correct or otherwise change the existing condition if it is other than the desired or intended one.

308 Assistant separable from receptacle:

This subclass is indented under subclass 306. Apparatus wherein the discharge assistant is located in the receptacle in such a manner that it may be removed therefrom (e.g., for placement in another receptacle).

(1) Note. There may or may not be specific structure for attaching or joining the assistant to the receptacle.

309 Pivotably displaceable assistant and member for shielding its fixed end:

This subclass is indented under subclass 306. Apparatus wherein the discharge assistant is mounted for pivotable movement about the center of the receptacle, and a member capable of supporting that portion of the contents of the receptacle which overlies it is located proximately above that end of the assistant about which the pivotable movement takes place.

(1) Note. The member may be for the purpose of preventing the contents of the bin from descending into and clogging an outlet located centrally of the floor and into which the assistant discharges, or, in the event that the assistant discharges, instead, to another conveyor, it may be for the purpose of protecting an interconnecting drive means (e.g., a transmission) therebetween, etc.

310 Comprising screw conveyor:

This subclass is indented under subclass 306. Apparatus wherein the discharge assistant consists of one or more conveyors of the kind having a material-moving element in the form of a helical thread.

311 Including means for loosening packed material:

This subclass is indented under subclass 310. Apparatus wherein either the material-moving element of the screw conveyor, or a device which undergoes movement simultaneously with the conveyor, is provided with means (e.g., teeth) for penetrating and dislodging material in the receptacle, which material (e.g., ensilage) comprises particles which adhere sufficiently to one another to resist, at least in part, gravity-induced flow.

SEE OR SEARCH THIS CLASS, SUBCLASS:

321, for a loosening means in the environment of a top-located, compound motion discharge assistant.

312 Having receptacle-reacting element of displaceable-movement drive means located on conveyor:

This subclass is indented under subclass 310. Apparatus wherein the means for displaceably driving the conveyor includes an element which is mounted on the conveyor and moves therewith, which element engages the receptacle for the purpose of pivotably or translatably moving the conveyor.

(1) Note. There also may be cooperating structure on the receptacle; for example, the element may be a toothed wheel which is rotated about the longitudinal axis of the conveyor and which drivingly

engages a rack located on the receptacle adjacent its perimeter.

313 Having compound motion assistant operating on top of material:
This subclass is indented under subclass 305. Apparatus wherein a compound motion discharge assistant is located in such a manner as to initiate the discharging of material from the receptacle by removing material from the upper portion or surface of the charge.

314 Including wall cleaning means:
This subclass is indented under subclass 313. Apparatus including means for removing from a wall or walls of the receptacle material which accumulates thereon.

SEE OR SEARCH CLASS:
15, Brushing, Scrubbing, and General Cleaning, subclasses 104.05+ as explained in the reference thereto appearing in subclass 288 above.

315 Condition responsive:
This subclass is indented under subclass 313. Apparatus wherein means is provided to sense a condition of the receptacle, apparatus or material during a discharging operation, and additional means is provided to respond to the information obtained by the first means by initiating action on the part of a top-located assistant to correct or otherwise change the existing condition if it is other than the desired or intended one.

316 To maintain material surface horizontal:
This subclass is indented under subclass 315. Apparatus wherein the condition sensed by the first means is the relation of the top surface of the material to the horizontal, and the additional means responds to a departure from the horizontal on the part of the top surface by causing the assistant to remove material in such a manner that the top surface is made horizontal or more nearly so.

317 Route of material being discharged includes vertical segment through remainder of charge:
This subclass is indented under subclass 313. Apparatus wherein the material being removed from the top of the charge moves vertically downward in a path, structurally defined or otherwise, through the rest of the material in the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
297, for a static receptacle having a charging means and provided also with means for forming a vertical discharge passage in the material during the charging thereof.

318 With conveyor extending to discharge opening in sidewall of receptacle:
This subclass is indented under subclass 313. Apparatus provided with a driven conveyor for receiving material from the discharge assistant and moving it to an outlet in a side of the receptacle.

(1) Note. The outlet may be in the form of a vertical slit having a plurality of successive, movable or removable, closure elements; in such an instance, the conveyor descends by gravity with the lowering level of material in the receptacle, and the closure elements are open successively in accordance with the descent of the conveyor.

319 Screw-type pickup conveyor:
This subclass is indented under subclass 313. Apparatus wherein the discharge assistant consists of one or more conveyors of the kind having a material-moving element in the form of a helical thread.

320 Including plural screw elements:
This subclass is indented under subclass 319. Apparatus wherein there are two or more screw conveyors, the axes of which are either parallel with, or angularly related to, one another, and which conveyors are, at least for the most part, coextensive with one another (e.g., side by side).

321 Including means for loosening packed material:
This subclass is indented under subclass 319. Apparatus wherein the material-moving element of the screw conveyor, or a device which undergoes movement simultaneously with the conveyor, is provided with means for penetrating, scraping, or otherwise freeing material in the receptacle for movement, which material

(e.g., ensilage) comprises particles having a tendency to adhere to one another.

(1) Note. The material frequently is of a kind (e.g., ensilage) consisting of particles which tend to adhere to one another.

SEE OR SEARCH THIS CLASS, SUBCLASS:
311, for a loosening means in the environment of a bottom-located, compound motion discharge assistant.

322 Means for displacing assistant involves driven, wheel-like, support member rolling on surface of material:
This subclass is indented under subclass 313. Apparatus wherein the discharge assistant is driven displaceably by a powered, rotating member (e.g., a wheel) which supports, at least in part, the conveyor, and which member is supported, in turn, by drivingly engaging the surface of the material in the receptacle.

323 Condition responsive:
This subclass is indented under subclass 304. Apparatus wherein means is provided to sense a condition of the receptacle, apparatus or material during an unloading operation, and additional means is provided to respond to the information obtained by the first means by initiating action on the part of a nongravity discharging device to correct or otherwise change the existing condition if it is other than the desired or intended one.

324 Including flail:
This subclass is indented under subclass 304. Apparatus wherein the unloading means includes at least one device consisting of a rotatably driven, vertical shaft having flexible, arm-like elements extending radially (i.e., in a generally horizontal plane) therefrom.

(1) Note. The elements may serve in conjunction with other structure (e.g., a helical thread formed on the vertical shaft) in unloading the receptacle, or they may act alone in doing so.

(2) Note. The device sometimes (e.g., when unloading ensilage) serves also to dislodge or loosen the material for movement.

(3) Note. The elements may droop to a position alongside the shaft when the latter is not in motion.

325 Including one or more driven conveyors located within or partly within receptacle for making initial pickup of material:
This subclass is indented under subclass 304. Apparatus wherein the unloading means comprises one or more conveyors of a driven nature, which are located wholly or partly within the receptacle, and which engage the material, put it in motion toward a desired point of release, and carry it thereto.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 550.01+ explained in the reference thereto appearing in subclass 304 above.

326 At least one of screw type:
This subclass is indented under subclass 325. Apparatus wherein the conveyor, or at least one of the conveyors, is of a kind consisting of a shaft having a helical thread thereon.

327 At least one of endless type:
This subclass is indented under subclass 325. Apparatus wherein the conveyor, or at least one of a plurality of them, is of the kind which includes an endless member in the nature of an apron, band, belt, chain, etc.

328 Gravity discharge of a gated, static receptacle to one or more vehicle-mounted receivers:
This subclass is indented under subclass 288. Apparatus in which the structure for facilitating the movement of the charge is a gate which controls the passage of the material from the receptacle into a receiver carried by a vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
216, for the combination of a chamber of a type utilized for a heating function, which chamber discharges by gravity, and a material guiding, moving, or stopping means beyond the exit thereof.

329 Located on moving vehicle:
This subclass is indented under subclass 328. Apparatus in which the vehicle-mounted receiver is in motion during the transfer of the charge from the receptacle into the receiver.

331.01 MOVABLE RACK HAVING SUPERPOSED, CHARGE-SUPPORTING ELEMENTS, AND EXTERNAL MEANS FOR CHARGING OR DISCHARGING ELEMENTS:
This subclass is indented under the class definition. Subject matter comprising a portable framework or stand having load supporting receptacles arranged one above the other and having means supported externally from the framework or stand to place a load on or remove a load from the receptacles.

SEE OR SEARCH THIS CLASS, SUBCLASS:
564, for the charging or discharging of one or more endless or rotary carriers by an elevator or hoist.
567, for the charging or discharging of one or more endless or rotary carriers by a vertically swinging load support.

331.02 Rotating or circulating rack:
This subclass is indented under subclass 331.01. Subject matter wherein the rack is turning about its axes or moving in an endless closed circuit to facilitate insertion or removal of articles.

331.03 Charge-supporting elements moving horizontally:
This subclass is indented under subclass 331.02. Subject matter wherein the endless closed circuit is confined in a horizontal plane.

331.04 Charge-supporting elements moving vertically:
This subclass is indented under subclass 331.02. Subject matter wherein the endless circuit is confined in a vertical plane.

331.05 Rack as a unit rotating about vertical axis:
This subclass is indented under subclass 331.02. Subject matter wherein the rack turns as a unit about a vertical axis.

331.06 Wheeled rack:
This subclass is indented under subclass 331.01. Subject matter wherein the rack is provided with wheels.

(1) Note. The wheels support the entire rack during movement to and from the charging or discharging means.

331.07 Simultaneous charging or discharging of charge-supporting elements:
This subclass is indented under subclass 331.06. Subject matter wherein load supporting receptacles are loaded or unloaded at the same time.

331.08 Charging or discharging means is a pusher:
This subclass is indented under subclass 331.06. Subject matter which includes a loading or unloading means having a member which exerts a horizontal force on the load for directing the load toward load supporting receptacles.

331.09 Charging or discharging means is a conveyor:
This subclass is indented under subclass 331.06. Subject matter which includes a loading or unloading means having a driver which moves the load to and from load supporting receptacles.

331.1 Charging or discharging means is a reciprocating arm:
This subclass is indented under subclass 331.06. Subject matter which includes a loading or unloading means having an extended member which supports the load at one end and having a back and forth horizontal movement.

331.11 Charging or discharging means having elevating means to present load at a predetermined level:
This subclass is indented under subclass 331.06. Subject matter which includes a loading or unloading means having a member which raises or lowers the load to a designated level.

331.12 Rack formed by rotatable screws:
This subclass is indented under subclass 331.01. Subject matter wherein the rack comprises a cylindrical member which turns about

a vertical axis and having a plurality of helical or spiral ribs or threads which engage and advance the load parallel to the axis of rotation.

331.13 Rack moved by conveyor relative to charging or discharging means:
This subclass is indented under subclass 331.01. Subject matter wherein the rack is moved by a driver member which carries the rack along a horizontal path to and from a locator adjacent the charging or discharging means.

331.14 Rack moved vertically by elevating means:
This subclass is indented under subclass 331.01. Subject matter wherein the rack is raised or lowered by a member to a position for loading or unloading the load supporting receptacles.

331.15 Having means for detecting presence of article on rack:
This subclass is indented under subclass 331.14. Subject matter wherein the rack includes a sensor which detects the presence of a load on the rack.

(1) Note. The sensor in response to detecting the load actuates a device which controls the loading and unloading of the load supporting receptacles.

331.16 Charging or discharging means is a pusher:
This subclass is indented under subclass 331.14. Subject matter which includes a loading or unloading means having a member which exerts a horizontal force on the load for directing the load toward load supporting receptacles.

SEE OR SEARCH THIS CLASS, SUBCLASS:
331.08, for charging or discharging of load supporting receptacles by pusher means for wheeled rack.

331.17 Charging or discharging means is a conveyor:
This subclass is indented under subclass 331.14. Subject matter which includes a loading or unloading means having a conveyor which moves the load to and from load supporting receptacles.

SEE OR SEARCH THIS CLASS, SUBCLASS:
331.09, for charging or discharging of load supporting receptacles by conveyor means for wheeled rack.

331.18 Charging or discharging means is a reciprocating arm:
This subclass is indented under subclass 331.14. Subject matter which includes a loading or unloading means having an extended member which supports the load at one end and having a back and forth movement.

SEE OR SEARCH THIS CLASS, SUBCLASS:
331.1, for charging or discharging of load supporting receptacles by reciprocating means for wheeled rack.

332 RECEPTACLE HAVING CHARGING OR DISCHARGING MEANS AND ADAPTED FOR RELOCATION FROM ONE OR ANOTHER OF A PLURALITY OF SITES OF INTERIM USE:
This subclass is indented under the class definition. Apparatus comprising a receptacle and means for charging or discharging it, which receptacle and means are intended to be used more or less temporarily at each of a plurality of sites and are accordingly adapted (e.g., by a provision for reducing the overall size to facilitate transport) to be relocated from one site to another.

(1) Note. The relocating of the receptacle does not contemplate the use of the receptacle for the purpose of transporting a load.

SEE OR SEARCH THIS CLASS, SUBCLASS:
333, through 402, for the combination of a load-transporting type vehicle and an external means for loading or unloading the vehicle.
467+, for self-loading or unloading vehicle.
919, for a body of art relating to the transport and erection of a storage member (e.g., a portable silo).

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 608+ for a dispensing device having a casing or support of an ambulant nature.

333 LOADING OR UNLOADING A RAILWAY CAR BY UTILIZING THE TRACTOR OF A TRACTOR-TRAILER, LOAD-TRANSPORTING TYPE VEHICLE TO MANEUVER THE TRAILER, OR A PART THEREOF, ONTO OR OFF THE CAR:

This subclass is indented under the class definition. Apparatus comprising a railway car for receiving or relinquishing a load in the form of a trailer, or a component thereof, of a load-transporting type vehicle, and a tractor for the trailer, the tractor serving to back, turn, or otherwise manipulate the trailer for placing the trailer or a component thereof on, or removing it from, the car.

(1) Note. See (2), (3), and (4) Notes of subclass 467.

334 MOVING, WHEELED, LOAD-TRANSPORTING TYPE VEHICLE AND LOADING OR UNLOADING DEVICE THEREFOR, SUPPORTED AT LEAST IN PART INDEPENDENTLY OF THE VEHICLE AND TRAVELING THEREWITH DURING TRANSFER OF LOAD THEREBETWEEN:

This subclass is indented under the class definition. Apparatus comprising a moving, wheeled, load-transporting type vehicle and a device for traveling with the vehicle for the purpose of delivering a load to the vehicle or removing a load from it. The device is not supported in its entirety by the vehicle, although it may receive a portion of its support therefrom. The device may derive its movement from some form of interconnection with the vehicle (e.g., a separable coupling, an arm to contact the means and move it along with the vehicle, etc.); however, it is sufficient if their movement is coordinated in any other manner.

(1) Note. See (2), (3), and (4) Notes of subclass 467.

SEE OR SEARCH THIS CLASS, SUBCLASS:

340+, for the combination of a plurality of wheeled, load-transporting type vehicles and means external (in part, at least) thereto for transferring a load from one vehicle to another, and see the reference in that subclass (340) to this subclass (334).

335 Loading device having capability for controlling direction of output therefrom:

This subclass is indented under subclass 334. Apparatus wherein the device is a vehicle loader and includes structure for regulating the direction in which material, intended to be loaded onto the vehicle, leaves the device.

336 Suspendedly supported device:

This subclass is indented under subclass 334. Apparatus wherein the device receives its support from an overhead cable or track.

(1) Note. The device may be a loader for a vehicle which is suspended from another cable or track (e.g., an aerial tramway car).

337 WHEELED, LOAD-TRANSPORTING TYPE VEHICLE UTILIZES ITS UNINTERRUPTED, FORWARD MOTION TO CAUSE AN EXTERNAL, LOAD-ENGAGING STRUCTURE TO REMOVE ITS LOAD:

This subclass is indented under the class definition. Apparatus comprising a wheeled vehicle of a load-transporting type which is moving continuously in its normal direction of travel, and external, load-contacting structure which is so positioned relative to the vehicle as to extract a load therefrom as the result of the movement of the vehicle relative to the structure.

(1) Note. See (2), (3), and (4) Notes of subclass 467.

338 WHEELED, LOAD-TRANSPORTING TYPE VEHICLE UTILIZES ITS UNINTERRUPTED, FORWARD MOTION TO

CAUSE AN EXTERNALLY SUPPORTED LOAD TO BE TRANSFERRED TO IT:
This subclass is indented under the class definition. Apparatus comprising a wheeled vehicle of a load-transporting type which is moving continuously in its normal direction of travel, and external structure in the nature of a load support or a device (e.g., a trip) for controlling the release of a load which is held by such a support, which structure or device is so positioned relative to the vehicle that the movement of the vehicle relative thereto results in extracting a load from the structure or in causing the device to release of a load for movement onto the vehicle.

(1) Note. See (2), (3), and (4) Notes of subclass 467.

339 WHEELED, LOAD-TRANSPORTING TYPE VEHICLES FORMING A TRAIN, AND LOADING OR UNLOADING MEANS THEREFOR, LOCATED AT LEAST IN PART THEREON:
This subclass is indented under the class definition. Apparatus comprising two or more wheeled vehicles of a load-transporting type which are arranged tandemly to form a train, and means to load or unload one or more of the vehicles, which means derives at least a portion of its support from at least one of the vehicles but is external, at least in part, to at least one of the vehicles.

(1) Note. Classification here is not excluded by the presence in the train of an additional vehicle of a nonload-transporting type, which vehicle supports, in whole or in part, the loading or unloading means.

(2) Note. While the vehicles maintain a tandem relationship during a load-transporting operation, they may move relative to one another for loading or unloading.

(3) Note. See (2), (3), and (4) Notes of subclass 467.

SEE OR SEARCH THIS CLASS, SUBCLASS:
809, for a process of charging or discharging a load-transporting type vehicle and external means cooperating in the loading or unloading thereof.

340 WHEELED, LOAD-TRANSPORTING TYPE VEHICLES AND MEANS FOR TRANSFERRING, OR ENABLING TRANSFER OF, LOAD FROM ONE VEHICLE TO ANOTHER:
This subclass is indented under the class definition. Apparatus comprising two or more wheeled vehicles of a load-transporting type and means for moving, or facilitating the movement of, a load between two of the vehicles.

(1) Note. The means is always external, totally or in part, to at least one of the load-transporting type vehicles.

(2) Note. See (2), (3), and (4) Notes in subclass 467.

SEE OR SEARCH THIS CLASS, SUBCLASS:
334+, for the combination of a moving, wheeled, load-transporting type vehicle and a device which travels with the vehicle for the purpose of loading or unloading it. While the device of that subclass (334) may possess certain vehicular aspects (e.g., wheels), it does not constitute a vehicle of the load-transporting type.
809, for a process of charging or discharging a load-transporting type vehicle and external means cooperating in the loading or unloading thereof.

341 By additional load-supporting vehicle for moving with load from one load-transporting type vehicle to the other:
This subclass is indented under subclass 340. Apparatus wherein the transferring means comprises a vehicle of a type which is capable of supporting a load for the purpose of moving with it between the load-transporting type vehicles.

342 Additional vehicle comprises overhead traversing hoist:
This subclass is indented under subclass 341. Apparatus wherein the additional vehicle in one which is provided with means for raising or lowering a load and is supported, during its transfer of the load, at an elevation which is

superior to that of at least one of the load-transporting type vehicles.

343 With means on each vehicle cooperating to effect, or facilitate, transfer of load:
This subclass is indented under subclass 340. Apparatus wherein the transferring means consists of two components or portions, one being located on one vehicle and the second on the other vehicle, the two components or portions cooperating with each other to cause, or assist in, the movement of a load between the vehicles.

344 With driven load-engaging device, supported at least in part externally of the vehicles, for moving load therebetween:
This subclass is indented under subclass 340. Apparatus wherein the transferring means comprises at least one powered device (hoist, winch, conveyor, etc.) which engages a load and moves it from one vehicle to the other, or at least part of the way from one to the other, the device being supported wholly or in part by one or more elements, structures, surfaces, etc., which elements, etc., are separate from either of the vehicles.

345 Means is confined to one of the vehicles:
This subclass is indented under subclass 340. Apparatus wherein the transferring means is located entirely on either the vehicle which is giving up a load or the vehicle which is receiving that load.

346 Means comprises tiltable load-supporting portion:
This subclass is indented under subclass 345. Apparatus wherein the means comprises a load-supporting member (e.g., bucket, dump body, platform, etc.), which member is mounted for movement about an axis.

(1) Note. Most frequently, the member is the load body of a vehicle which is intended to discharge by gravity.

347 Means comprises elevatable load-supporting portion traveling in path including vertical, rectilinear movement:
This subclass is indented under subclass 345. Apparatus wherein the means comprises a load-supporting member on one of the vehicles, which member travels in a path which is vertical and rectilinear, in whole or in part.

(1) Note. The member often is an elevatable load body on one of the vehicles.

SEE OR SEARCH THIS CLASS, SUBCLASS:
495+, for a self-loading or unloading vehicle having an elevatable load body.
540+, for a self-loading or unload vehicle having a means to raise or lower a load in a path which includes vertical, rectilinear movement.

348 Having portion suspended from vehicle on overhead way:
This subclass is indented under subclass 347. Apparatus wherein one vehicle travels on a track or surface which is above that on which the other vehicle is supported, and wherein the load-supporting member is positioned beneath the first-named vehicle and serves to lower a load to, or raise a load from, the second-named vehicle.

349 WHEELED, LOAD-TRANSPORTING TYPE VEHICLE HAVING DRIVEN MEANS THEREON FOR REPOSITIONING LOAD-SUPPORTING PORTION OF VEHICLE TO CAUSE OR FACILITATE MOVEMENT OF LOAD TO OR FROM AN EXTERNAL COOPERATING MEANS:
This subclass is indented under the class definition. Apparatus comprising a wheeled vehicle of a load-supporting type which is provided with driven means for repositioning (e.g., tilting, elevating, etc.) that element, member, etc., of the vehicle by which its load is supported, and external means for cooperating in the loading or unloading of the vehicle by serving to either receive a load from the vehicle or relinquish a load thereto, the purpose of repositioning the element, member, etc., being to move, or aid in the movement of, the load from the vehicle to the means or from the means to the vehicle.

(1) Note. See (2), (3), and (4) Notes in subclass 467.

SEE OR SEARCH THIS CLASS, SUBCLASS:

468, 469+ and 495+, for a self-loading or unloading vehicle having a repositionable load-supporting portion.

809, for a process of charging or discharging a load-transporting type vehicle and external means cooperating in the loading or unloading thereof.

350 Load-supporting portion pivotable about horizontal axis:

This subclass is indented under subclass 349. Apparatus wherein the element, member, etc., is mounted for pivotable movement about an axis which lies in a horizontal plane.

351 Cooperating means comprises or includes a conveyor:

This subclass is indented under subclass 349. Apparatus wherein the external cooperating means either comprises a conveyor of a driven or a gravity type or is a load-supporting structure which includes such a conveyor.

352 WHEELED, LOAD-TRANSPORTING TYPE VEHICLE HAVING DRIVEN MEANS THEREON FOR ENGAGING AND MOVING LOAD HORIZONTALLY, OR WITH HORIZONTAL COMPONENT, TO OR FROM AN EXTERNAL COOPERATION MEANS:

This subclass is indented under the class definition. Apparatus comprising a wheeled vehicle of a load-transporting type which is provided with driven means for engaging and moving, either in a horizontal direction or in a direction having a horizontal component, a load to or from the vehicle, and external means cooperating in the loading or unloading of the vehicle by serving to either receive a load from the vehicle or relinquish a load thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:

467, see (2), (3), and (4) Notes.

501+, 506, 507+, and 539+, for a self-loading or unloading vehicle having a driven means (except for some gravity conveyors in 529+ and 537) for moving a load to or from the vehicle, and see particularly subclasses 509+, 541+, 549, and 559 for moving a load either in a horizontal direction or in a direction having a horizontal component.

809, for a process of charging or discharging a load transporting-type vehicle and external means cooperating in the loading or unloading thereof.

353 Cooperating means comprises or includes a conveyor:

This subclass is indented under subclass 352. Apparatus wherein the external cooperating means either comprises a conveyor of a driven or a gravity type or is a load supporting structure which includes such a conveyor.

354 WHEELED, LOAD-TRANSPORTING TYPE VEHICLE AND EXTERNAL MEANS FOR SUPPORTING VEHICLE IN TOTO AND REORIENTING IT INTO LOAD-RELEASING ATTITUDE:

This subclass is indented under the class definition. Apparatus comprising a wheeled vehicle of a load-transporting type which is to be unloaded, and means external of the vehicle which supports the vehicle in its entirety and moves (e.g., tips, inverts, rotates, etc.) it bodily into an attitude in which its load will depart by gravity.

SEE OR SEARCH THIS CLASS, SUBCLASS:

467, see (2), (3), and (4) Notes.

809, for a process of charging or discharging a load-transporting type vehicle and external means cooperating in the loading or unloading thereof.

355 With driven carrier for receiving released load:

This subclass is indented under subclass 354. Apparatus wherein a load carrier of a driven nature is provided for receiving and taking away the load caused by the supporting and reorienting means to depart from the vehicle.

356 Endless-type conveyor:

This subclass is indented under subclass 355. Apparatus wherein the driven carrier comprises a powered conveyor of the endless type.

357 Vehicle of rail-guided type and track section having rails configured to tilt or invert vehi-

cle as result of moving thereonto or progressing therealong:
This subclass is indented under subclass 354. Apparatus wherein the vehicle is of a kind which is guided by the engagement of its wheels with rails, and the supporting and reorienting means comprises a section of track onto or along which the vehicle moves, which track section includes rails which are so configured as to cause the vehicle to tilt or invert.

358 Vehicle-holding member rollable along underlying support (i.e., axis of pivot of vehicle travels laterally):
This subclass is indented under subclass 354. Apparatus wherein the supporting and reorienting means comprises a vehicle-holding member in the nature of a cage or related structure which at least partially encompasses the vehicle and which member includes a peripheral element (e.g., a rim) whereby it may roll, while holding the vehicle, along the top of a supporting element which extends in a generally horizontal direction.

359 Vehicle-holding framework rotatable about fixed axis passing through framework and parallel to longitudinal axis of vehicle:
This subclass is indented under subclass 354. Apparatus wherein the supporting and orienting means comprises a vehicle-holding member in the nature of a cage or related structure which at least partially encompasses the vehicle and which member is rotatable, while holding the vehicle, about an axis which is fixed and which passes through the member in a direction which is parallel to the longitudinal axis of the vehicle held therein.

360 Including movable element to clamp vehicle to framework:
This subclass is indented under subclass 359. Apparatus wherein the framework includes at least one member which is relocatable into a position wherein it restrains the vehicle from shifting relative to the framework.

361 With rotation responsive moving means:
This subclass is indented under subclass 360. Apparatus wherein means actuated by or otherwise coordinated with the rotatable movement of the framework is provided for moving the member.

362 Pivotably movable structure, at least initially in underlying relation to vehicle:
This subclass is indented under subclass 354. Apparatus wherein the supporting and reorienting means comprises a member (e.g., a platform) mounted to swing about an axis (structural or mathematical) and wherein the member, prior to tipping, inverting, rotating, etc., the vehicle, forms an underlying support therefor.

(1) Note. The axis usually lies in a horizontal plane.

363 With means to agitate vehicle or its load:
This subclass is indented under subclass 362. Apparatus wherein means (e.g., a vibrator) is provided to shake or otherwise agitate a vehicle on the member and/or a load in the vehicle for the purpose of assisting or promoting gravity movement of the load from the vehicle.

364 With means for shifting axis of pivot or tilt of structure in vertical direction:
This subclass is indented under subclass 362. Apparatus wherein means is provided for changing the elevation of the axis about which the member swings.

365 With means to affect exit of load from vehicle:
This subclass is indented under subclass 364. Apparatus wherein means is provided for redirecting, slowing, stopping, etc., the movement of material as it is departing from a vehicle which is being tilted, inverted, etc., by the member.

366 Axis of pivot parallels longitudinal axis of vehicle:
This subclass is indented under subclass 364. Apparatus wherein the axis about which the member swings is so located as to be parallel with the longitudinal axis of a vehicle on the member.

367 With means to retard or stop vehicle approaching structure:
This subclass is indented under subclass 362. Apparatus wherein means is provided to slow or bring to a halt a vehicle which is moving toward the member.

368 With means to guide departing load toward vehicle exit:
This subclass is indented under subclass 362. Apparatus wherein means (e.g., a deflector) is provided for directing material which is beginning to move from the vehicle to the doorway or other opening through which it is intended that the material shall leave the vehicle.

369 With means to operate vehicle-mounted closure member:
This subclass is indented under subclass 362. Apparatus wherein means is provided to open, close, or otherwise change the position of a door, gate, etc., which is located on the vehicle and which governs the exit or entry of material from or to the vehicle.

370 With nonaligned paths for approach and departure of vehicle:
This subclass is indented under subclass 362. Apparatus wherein a ramp, guide, trackway, etc., is provided for a vehicle entering the member and another, differently directed ramp, etc., is provided for a vehicle leaving the member.

(1) Note. The entrance and exit ramps, etc., frequently are related to the member and to each other in such a manner that a vehicle can traverse both ramps with only the aid of gravity.

371 Axis of pivot or tilt of structure parallels longitudinal axis of vehicle thereon:
This subclass is indented under subclass 362. Apparatus wherein the axis about which the member swings is so located as to be parallel with the longitudinal axis of a vehicle on the member.

372 With movable element to clamp vehicle to structure:
This subclass is indented under subclass 371. Apparatus wherein at least one member is provided which is relocatable into a position wherein it restrains the vehicle from shifting relative to the member.

373 LOAD-TRANSPORTING TYPE VEHICLE AND EXTERNAL MEANS COOPERATING IN THE LOADING OR UNLOADING THEREOF:
This subclass is indented under the class definition. Apparatus comprising a vehicle of a load-transporting type which is to be loaded or unloaded, and means external of the vehicle which either loads or unloads the vehicle or contributes in some manner thereto.

(1) Note. For this particular subclass (373), the vehicle need not be of the wheeled kind.

SEE OR SEARCH THIS CLASS, SUBCLASS:
467, see (2), (3), and (4) Notes.
809, for a process of charging or discharging a load-transporting type vehicle and external means cooperating in the loading or unloading thereof.

SEE OR SEARCH CLASS:
244, Aeronautics, subclass 137.1 for devices and arrangements for loading or unloading a vehicle of the aircraft type, which devices, etc., may include means which is external of the aircraft for cooperating in the loading or unloading thereof.

374 Means decelerates moving, wheeled vehicle, load continues to move and leaves vehicle:
This subclass is indented under subclass 373. Apparatus wherein the external means comprises a device, element, or member for applying a retarding force to a moving vehicle for slowing or stopping it, the retardation being of a degree such that a load on the vehicle (and not anchored thereto) will continue to move and thus be unloaded from the vehicle.

375 Means agitates, shakes, or vibrates wheeled vehicle or load therein to loosen load for departure from vehicle:
This subclass is indented under subclass 373. Apparatus wherein the external means comprises a device for applying a force to the vehicle, or directly to a load of material therein, which force is of a kind intended to prevent the material from clogging (e.g., “bridging”) or otherwise failing to move more or less readily from the vehicle.

376 Involving movement of load by gravity from wheeled vehicle:
This subclass is indented under subclass 373. Apparatus wherein the external means comprises a device, element, or member for causing the vehicle or a component thereof to move into an attitude or a position whereby the load is no longer restrained from responding to the force of gravity and thus departing from the vehicle.

377 Means initiates unloading of vehicle of type having load body, or other load holding means suspended therefrom:
This subclass is indented under subclass 376. Apparatus wherein the vehicle is of the kind which has a load containing portion, or a load supporting element, suspended below the running gear thereof, and the external means comprises a device, element or member which acts upon the vehicle or a part thereof to commence the unloading of the vehicle.

378 Bottom unloading body:
This subclass is indented under subclass 377. Apparatus comprising a load containing portion which includes structure (e.g., door, gate, pivotable body section, etc.) for releasing its load from a lower region thereof.

379 Bucketlike body having horizontal, reciprocable movement, and flexible strand means for driving it in at least one direction:
This subclass is indented under subclass 378. Apparatus wherein the load containing portion is in the nature of a receptacle which travels back and forth in a path which is generally horizontal, and wherein a driven cable, chain, rope, etc., is provided for moving the portion in at least one direction of its travel.

380 Flexible strand means serves also as initiating means:
This subclass is indented under subclass 379. Apparatus wherein the driven cable, chain, rope, etc., serves also as the device, element, or member which commences the unloading of the receptacle.

(1) Note. The driven means may initiate unloading by merely reversing its direction of movement, or it may include additional structure (e.g., a projection to serve as a trip) for doing so.

381 Tilting body:
This subclass is indented under subclass 377. Apparatus comprising a load containing portion which includes structure enabling it to be tipped into a load releasing attitude.

382 About axis parallel to direction of vehicle travel:
This subclass is indented under subclass 381. Apparatus wherein the tipping of the portion takes place about a line which is parallel to another line representing the path of travel of the vehicle.

383 Means cooperates with motion of vehicle to reorient load body, relative to wheels, into load releasing attitude:
This subclass is indented under subclass 376. Apparatus wherein the vehicle is in motion and the means comprises a device or structure which, as a result of the vehicle's movement, tilts, inverts or otherwise causes the load-holding portion of the vehicle to reposition itself, relative to the wheels of the vehicle, into an attitude whereby a load therein will fall therefrom.

SEE OR SEARCH CLASS:
105, Railway Rolling Stock, subclass 241.2 for a vehicle of that class which may include structure whereby it constitutes the vehicle subcombination of this subclass (383).

384 By pivoting body about axis parallel to longitudinal axis of vehicle to unload from side:
This subclass is indented under subclass 383. Apparatus wherein the load body pivots about an axis which is parallel to the longitudinal axis of the vehicle, thus resulting in a sidewise departure of the load.

385 Means comprises driven device for raising one end of vehicle upwardly relative to other end thereof:
This subclass is indented under subclass 376. Apparatus wherein the means comprises a device of a driven type for lifting or otherwise elevating one end of a vehicle body and undercarriage in order to cause a load therein to be

shifted by gravity toward, and eventually pass out from, the opposite end of the vehicle.

SEE OR SEARCH CLASS:
254, Implements or Apparatus for Applying Pushing or Pulling Force, appropriate subclasses for pushing or pulling implements which may be particularly adapted to raising one region of a vehicle relative to another region thereof, the line between the implements of various areas of that class and the devices of this subclass (325) not being established at the time of this reclassification.

386 Means comprises driven device for engaging and moving pivotable load body relative to remainder of vehicle:
This subclass is indented under subclass 376. Apparatus wherein the vehicle is of a kind which has a load holding portion which is mounted for moving pivotably relative to the rest (e.g., undercarriage) of the vehicle, and the means is a device of a driven type for causing the portion to pivot (e.g., tilt, invert, etc.).

SEE OR SEARCH CLASS:
254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 45+ for apparatus for lifting the body of a vehicle from the running gear or undercarriage thereof, which area has not been screened for art which may be in conflict with that of this subclass (386).

387 Means comprises device or structure for cooperating with motion of vehicle to initiate relocation of body component (e.g., floor or floor section, gate, etc.) thereof:
This subclass is indented under subclass 376. Apparatus wherein the vehicle is in motion and the means comprises a device or structure which, as a result of the vehicle's movement relative thereto, causes one or more movable components of the vehicle's body to be repositioned relative to the remainder of the body in such a manner as to provide an exit for part or all of the load of the vehicle, or, in the alternative, releases a latching mechanism for enabling the component to be repositioned by the force of gravity acting on either the component or the load, or on both.

(1) Note. It is not necessary that the motion of the vehicle continue for the duration of the movement of its load therefrom.

(2) Note. The means of this subclass may serve also to return the component (or components) to its nonload-exiting position; in fact, in the absence of a more appropriate locus, patents limited to claiming means for performing only this operation are classified here.

SEE OR SEARCH CLASS:
105, Railway Rolling Stock, subclass 241.2 for a vehicle of that class which may include structure whereby it constitutes the vehicle subcombination of this subclass (387).

388 Component comprises oppositely swinging, operatively interconnected gates:
This subclass is indented under subclass 387. Apparatus wherein the component comprises at least one pair of pivotably mounted closure members, which members are interlinked with one another in such a manner that they swing in opposite directions as each moves from its closed to its open, or its open to its closed, position.

389 Means comprises structure for cooperating with a maneuvering, wheeled vehicle to engage and acquire a load therefrom or to give up a load thereto:
This subclass is indented under subclass 373. Apparatus wherein the means comprises structure for supporting a load, which load will be removed from, or will be given up to, a vehicle which moves relative to the structure with other than continuous, unidirectional motion, the acquiring or relinquishing of the load being a direct result of the movement of the vehicle relative to the structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
333, for the loading or unloading of the trailer of a tractor-trailer type vehicle onto or from a railway car by utilizing the tractor to maneuver the trailer.
337, and 338, for removing a load from, or transferring a load to, respectively, a load support external of a vehicle by

utilizing the uninterrupted, forward motion of the vehicle.

390 Of driven type, for unloading a wheeled vehicle:
This subclass is indented under subclass 373. Apparatus wherein the means comprises one or more driven devices (e.g., conveyor, elevator, hoist, etc.) for removing a load from one or more vehicles of the wheeled type.

391 Including load raising or lowering device:
This subclass is indented under subclass 390. Apparatus wherein at least one device is of a type which imparts a change of elevation to the load.

392 Having means for also moving load laterally:
This subclass is indented under subclass 391. Apparatus wherein the raising or lowering device includes means for also imparting movement to the load in either a horizontal direction or a direction which includes a horizontal component.

393 With flexible, load-underlying element or surface:
This subclass is indented under subclass 392. Apparatus wherein the device has a load-engaging member in the nature of a flexible element or surface, which element or surface supports the load from beneath.

394 With bucket or scoop-type holder:
This subclass is indented under subclass 392. Apparatus wherein the device has a load-engaging member of a receptacle-like nature.

395 Including load pushing or pulling device:
This subclass is indented under subclass 390. Apparatus wherein at least one device is of a type which moves the load by applying thereto a force which is directed toward the intended destination of the load.

396 With additional means for aligning vehicle and an external load support:
This subclass is indented under subclass 395. Apparatus wherein the external means comprises, in addition to the pushing or pulling device, means for aligning the vehicle with a load support (surface, member, etc.) which is external to the vehicle and to, or from, which a load is to be pushed or pulled from, or to, the vehicle.

397 Means comprises repositionable supporting and/or guiding structure (e.g., chute, etc.) for conducting load moving by gravity to a wheeled vehicle:
This subclass is indented under subclass 373. Apparatus wherein the means compresses structure (e.g., an inclined chute, a vertical conduit, etc.) which forms a path for a load which is moving under the influence of gravity onto or into the vehicle, which structure is adjustable (e.g., to align it with the vehicle, to cut off the flow of the load, etc.).

398 Power-driven conveyor for loading a wheeled vehicle:
This subclass is indented under subclass 373. Apparatus wherein the means comprises one or more conveyors of a driven type for moving a load onto or into one or more vehicles of the wheeled type.

399 Raising or lowering device of driven type for loading a wheeled vehicle:
This subclass is indented under subclass 373. Apparatus wherein the means comprises one or more driven devices for imparting a change of elevation to a load for placing the load onto or into one or more vehicles of the wheeled type.

400 Pushing or pulling device for loading a wheeled vehicle by exerting a generally horizontal force on load:
This subclass is indented under subclass 373. Apparatus wherein the means comprises one or more devices for placing a load onto or into one or more vehicles of the wheeled type by applying to the load a generally horizontal force having a bearing in the direction of the destination of the load.

401 Means serves to align wheeled vehicle and load receiving or relinquishing structure:
This subclass is indented under subclass 373. Apparatus wherein the means comprises a device or structure (e.g., cooperating guide elements, device for shifting a vehicle, adjustable load-receiving platform, etc.) to align or improve the alignment of a vehicle of the wheeled type and a structure to, or from, which a load is to be moved from, or to, the vehicle.

402 Means comprises stationary guide or fixed anchor for cooperating with loading or unloading means located, at least in part, on wheeled article:

This subclass is indented under subclass 373. Apparatus wherein the means comprises a stationary device or a fixed structure, either of which constitutes an indispensable element of a loading or unloading means located on a vehicle of a wheeled type which is to be loaded or unloaded.

(1) Note. The means may consist, for example, of a post which serves to anchor the loading or unloading means, or it may be a guide pulley for a haulage cable of the means.

(2) Note. Except for the device or structure, the loading or unloading means usually is confined to the vehicle to be loaded or unloaded.

SEE OR SEARCH THIS CLASS, SUBCLASS:

352, for a wheeled, load-transporting type vehicle having a driven means thereon for engaging and moving a load horizontally, or with a horizontal component, to or from an external cooperating means, and wherein the driven means may utilize a stationary guide or fixed anchor of the kind included in this subclass (402).

403 DEVICE FOR EMPTYING PORTABLE RECEPTACLE:

This subclass is indented under the class definition. Devices for engaging and emptying portable receptacles or containers.

(1) Note. The patents in this and indented subclasses are primarily an art collection. Normally, the minimum requirements of these subclasses is the inclusion of (a) means to receive a receptacle in the form of a cradle or the like, or (b) means to grasp a receptacle in the form of grasping or seizing means, each of which means is instrumental in dumping the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

183, for the emptying of a separable receptacle utilized for charging a chamber of the heating type.

333, through 402, for devices for unloading vehicles, which devices are external to the vehicles.

639+, for an elevator or hoist device in which the load carrier may be a container and is dumped similar to a portable receptacle.

810, for a process of emptying a portable receptacle.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclass 260 for glassworking apparatus having product take-out or transfer means mounted above a mold; see the search notes thereunder.

164, Metal Founding, appropriate subclasses for devices for removing molded metallic objects from their molds.

404 For emptying contents thereof into portable receiving means:

This subclass is indented under subclass 403. Apparatus wherein the device engages the receptacle (e.g., a basket, bin, box, bucket, can, container, pail, etc.) and handles or moves it so as to cause it to be relieved of its contents, and wherein is provided a means to receive the contents, which means is of a kind which can be bodily relocated from one site to another.

(1) Note. The handling of the receptacle may involve merely picking it up, dumping its contents and setting it down, or, on the other hand, there may be a significant transporting aspect involved if the receiver is at a remote location.

405 By inverting both receptacle and receiving means in order to transfer contents from one to other:

This subclass is indented under subclass 404. Apparatus wherein the device juxtapositions the receptacle and the receiving means and then inverts both, thus causing the contents of the former to move or shift to the latter by the action of gravity.

(1) Note. The receptacle and the receiving means often comprise receptacles of a like nature, in which instance the receiving means is placed upside down above the receptacle and the assembly then inverted to cause the contents to move from one receptacle to the other.

SEE OR SEARCH THIS CLASS, SUBCLASS:

754, for means to reorient an article.

758+, particularly for means to invert an article.

406 Having receiving means mounted on wheeled vehicle:

This subclass is indented under subclass 404. Apparatus wherein the receiving means is mounted upon a wheeled vehicle and derives its portability therefrom.

407 With closure for receiving means and receptacle-responsive operating means for closure:

This subclass is indented under subclass 406. Apparatus wherein the receiving means is provided with a closure for that region of the means through which the contents of the receptacle passes, and means, responsive to a characteristic or function (e.g., attitude, location, movement, etc.) of the receptacle, is provided to move the closure from a content-blocking to a content-passing position and vice versa.

408 Device includes vertically swinging arm and receptacle support pivotably attached thereto:

This subclass is indented under subclass 406. Apparatus wherein the device includes a receptacle-moving member which is pivotable about a horizontal axis and a receptacle-engaging element on, pivotably attached to, the member.

409 Device includes track-guided, receptacle-supporting carrier:

This subclass is indented under subclass 406. Apparatus wherein the device includes a receptacle-engaging and moving member in the nature of a carriage, cradle, platform, etc., which is in guiding contact with an element in the nature of a track.

410 Device includes haulage cable:

This subclass is indented under subclass 406. Apparatus wherein the device includes a receptacle-engaging and moving member in the nature of a flexible, strand-like element for pulling the receptacle.

411 With container opening means:

This subclass is indented under subclass 403. Emptying devices including means for opening the receptacle prior to the emptying operation.

SEE OR SEARCH CLASS:

134, Cleaning and Liquid Contact With Solids, subclass 62 for devices which empty receptacles combined with means for cleaning such receptacles subsequent to their being emptied.

412 Rupturing or cutting type:

This subclass is indented under subclass 411. Devices in which the opening means comprises a sharp implement, e.g., knife, saw, etc., adapted to rupture or sever the receptacle.

SEE OR SEARCH CLASS:

30, Cutlery, subclass 2 for carton openers, and subclasses 400+ for can openers, in which no structure for removing or handling the contents of the carton or can is involved.

222, Dispensing, subclasses 80+ for dispensers having means for cutting or punching a receptacle placed in the dispenser for causing emptying of the receptacle into the dispenser.

413 Successive dumping from conveyed stack:

This subclass is indented under subclass 403. Devices which have combined therewith conveyor means so arranged as to move a stack of receptacles relative to said device in such manner as to feed successive receptacles into position to be emptied.

414 With gate or closure-type discharge control means:

This subclass is indented under subclass 403. Emptying devices including a closure or gate member carried by the device for covering or partially covering the receptacle to prevent premature emptying of its contents.

(1) Note. The expression "premature emptying" of the receptacle includes controlled discharge of its contents.

SEE OR SEARCH THIS CLASS, SUBCLASS:
407, for movable covers or gates controlling the discharge of material into a receiving bin.

SEE OR SEARCH CLASS:
222, Dispensing, subclass 165 for dispensers having a moveably mounted container and including a dispensing feature.

415 With jarring means:
This subclass is indented under subclass 403. Emptying devices including an abutment in the path of movement of the receptacle against which it is impinged to jar or shape loose the contents of the receptacle prior to or simultaneously with the discharge thereof.

416.01 Nongravity type:
This subclass is indented under subclass 403. Subject matter in which the device for emptying the receptacle (a) engages and lifts contents from the receptacle, or (b) forcibly removes them therefrom.

(1) Note. Grapple devices for removing individual articles from containers are not classified here unless they are designed for mutual cooperation with the receptacle or have combined therewith means for handling the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
618, and 729-741, for power operated grapples.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclasses 86.4 through 119.4 for miscellaneous hand grapples.

416.02 Changes spacing between articles:
This subclass is indented under subclass 416.01. Subject matter in which the contents include plural discrete articles and the emptying device changes the distance between the articles.

(1) Note. The spacing may be changed before, during, or after removal of the articles.

416.03 Horizontal movement of receptacle contents:
This subclass is indented under subclass 416.01. Subject matter in which the emptying device moves the contents substantially only horizontally from their resting or transport position in the receptacle to a position outside of the receptacle.

(1) Note. The emptying device may move the receptacle contents in other directions after removal from the receptacle.

416.04 Ejector:
This subclass is indented under subclass 416.01. Subject matter in which the emptying device is designed to apply a force behind the contents so as to push them in a forward direction from the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
416.09 through 416.12, for an ejector for emptying a receptacle in which the receptacle contents move in a direction other than horizontal at some stage during their removal from the receptacle.

416.05 Receptacle moved on conveyor past emptying device:
This subclass is indented under subclass 416.01. Subject matter in which the receptacle is transported by a conveyor to and from the emptying device.

416.06 Receptacle unloaded while in motion:
This subclass is indented under subclass 416.05. Subject matter in which the contents of the receptacle are removed while the receptacle is being conveyed.

416.07 Articles removed in layers:
This subclass is indented under subclass 416.01. Subject matter in which the contents are arranged in a plurality of layers and the

emptying device removes one or more, but less than all of the layers at a time.

416.08 Receptacle has spaced article supports:
This subclass is indented under subclass 416.01. Subject matter in the receptacle includes plural distinct structures or surfaces spaced from each other for supporting the contents.

416.09 Ejector:
This subclass is indented under subclass 416.01. Subject matter in which the emptying device applies a force behind the contents so as to push or eject them in a forward direction from the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
416.04, for an ejector for removing the contents of a receptacle by moving them horizontally.

416.1 Article support deformed during load ejection:
This subclass is indented under subclass 416.09. Subject matter in which the shape of a support for the contents changes to facilitate removal of the contents.

416.11 Article lifted from receptacle and subsequently pushed horizontally:
This subclass is indented under subclass 416.09. Subject matter in which the emptying device initially moves the contents substantially vertically to a point outside the receptacle, then pushes them horizontally.

416.12 Receptacle lowered onto support to eject article therefrom:
This subclass is indented under subclass 416.09. Subject matter in which the receptacle is elevated relative to a supporting surface while holding the contents and subsequent placement of the receptacle onto the supporting surface results in operation of the ejector to remove the contents.

418 Orienting endless, roller, or gravity conveyor:
This subclass is indented under subclass 403. Emptying devices comprising endless, roller and/or gravity conveyor means so constructed or arranged as to advance and orient a receptacle carried thereby for gravity discharge of the contents thereof.

(1) Note. Conveyors, here involved are any of the type classified in Class 193, Conveyors, Chutes, Skids, Guides, and Ways, or Class 198, Conveyors: Power-Driven.

SEE OR SEARCH CLASS:
141, Fluent Material Handling With Receiver or Receiver Coacting Means, subclasses 118 and 124 for filling devices combined with means for removing overfill of the receiver tilting or inverting type.
198, Conveyors: Power-Driven, subclasses 373+ for a conveyor for changing the attitude of an item relative to its conveyed direction, which item may be a receptacle to be filled or emptied.

419 Rotary cradle:
This subclass is indented under subclass 403. Emptying devices comprising a framework designed to receive a receptacle which framework is mounted for rotation about an axis so as to invert the receptacle to cause or assist discharge of the contents therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:
354+, for the combination of a wheeled, load-transporting type vehicle and external means for supporting the vehicle in toto and reorienting it into a load-releasing attitude.
639+, for an elevator or hoist having tilting carrier and means for tilting such carrier to cause discharge of its contents.
680+, for vertically swinging load-supporting members having means to load or unload said members.

SEE OR SEARCH CLASS:
222, Dispensing, subclass 165 for changing cartridges in or refilling moveably mounted supply containers.
248, Supports, subclasses 128+ for stands adapted to moveably support a receptacle to dispense its contents.

420 Nonfixed pivot:
This subclass is indented under subclass 419. Rotary cradles in which the pivotal axis of the cradle is movable rectilinearly and/or in an arcuate path.

SEE OR SEARCH THIS CLASS, SUBCLASS:
354+, as explained in subclass 419, and especially subclasses 364+ thereunder for a pivotable supporting means, which means has a vertically shiftable axis of pivot.
404+, for a portable emptying device combined with a portable material receiver.

421 Oscillated:
This subclass is indented under subclass 419. Rotary cradles in which the cradle has a to-and-fro motion about its axis of rotation, i.e., movable to a dumping position and reversible to load-receiving position.

422 Elevator type:
This subclass is indented under subclass 403. Receptacle dumping devices comprising means for translating a filled receptacle upwardly prior to manipulating it to discharge its contents.

SEE OR SEARCH THIS CLASS, SUBCLASS:
420, for similar devices which include a cradle for receiving the receptacle.
639+, for elevator or hoist devices in which the load carrier may be a receptacle.

423 Differentially operated cables:
This subclass is indented under subclass 422. Devices in which the elevating and inverting means comprises a plurality of receptacle suspending cables, all or some of which may constitute the means for elevating the receptacle, and certain one or ones of which may be moved relative to or at a speed different than the others to invert the receptacle.

(1) Note. Since no specific home is provided in Class 254 for differentially operated hoist cables cooperating to rotate as well as elevate a load, patents showing such cable arrangement for dumping the contents of a receptacle but not claiming the receptacle-engaging means are included here.

SEE OR SEARCH THIS CLASS, SUBCLASS:
560+, for miscellaneous cable arrangements adapted to rotate as well as elevate a load, other than a receptacle, to orient it.
639+, for elevator or hoist type devices in which the load carrier is tilted by differentially operated cables.

424 Coacting catch or support:
This subclass is indented under subclass 422. Receptacle dumpers comprising means for engaging a receptacle to elevate or lower it and stationary means in or adjacent to the path of movement of the receptacle with which the receptacle is engageable to cause rotation of the receptacle upon movement of the receptacle relative to the stationary means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
652+, for an elevator or hoist having a tilting carrier actuated by a catch or abutment while in motion.

425 Upending (e.g., rocking or tilting about end, etc.):
Emptying devices under subclasses 403 comprising means engageable with an end and/or side of a receptacle and movable in such a direction as to cause rotation or tilting of the receptacle while in constant contact with a supporting surface upon which it is moved.

SEE OR SEARCH THIS CLASS, SUBCLASS:
385, for the combination of a load-transporting type vehicle and external means of a driven type for raising one end of the vehicle relative to the other end thereof to cause a load to move therefrom by gravity.

426 WHEEL AND WHEEL-TYPE ARTICLE HANDLER AND TRANSPORTER:
This subclass is indented under the class definition. Devices comprising a mobile support having means for engaging the outer circumference of a wheel or wheel-like object to sup-

port and transport it in upright position and including (a) means to handle or manipulate it while in upright position, or (b) means to secure the load in upright position during transportation thereof, or (c) means for directing or loading a wheel onto said support.

(1) Note. This and indented subclasses deal primarily with the problem of handling a wheel prior to or subsequent to its removal from an axle. The specialized use of these devices is considered sufficient reason to warrant classifying them together.

(2) Note. These devices include structural features designed to engage the outer surface of a wheel or wheel-like object. Reference to "wheel-engaging means" only is not sufficient to place the invention here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

458+, for vehicles having elevating cooperating shelf-type article engaging means for general use.

463, for a vehicle having an auxiliary carrier of the rim, tire, or wheel type, which carrier is movable from the normal carrying position to a position to load or unload the same.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 244+ for wheel pulling devices.

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 2+ for lift trucks, and other appropriate subclasses for wheel-lifting devices which include the wheel-engaging element by name only. See particularly subclasses 120+ for single throw lever wheel positioning means.

280, Land Vehicles, appropriate subclasses for vehicular structures for carrying wheels in which the load-engaging feature is included by name only.

427 Elevator-type engaging means:

This subclass is indented under subclass 426. Devices in which the wheel engaging means subsequent to engagement with the wheel is translated upwardly.

428 Vertically swinging article engager:

This subclass is indented under subclass 426. Devices in which the wheel-engaging means comprises swinging or pivotally mounted means for engaging and elevating the wheel.

SEE OR SEARCH CLASS:

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 8+ for lift trucks having single throw lever means for elevating a load.

429 Opposed horizontally reciprocable engaging elements:

This subclass is indented under subclass 426. Devices in which the wheel engaging means includes opposed horizontally reciprocable means designed to impart vertical movement to a wheel engaged therebetween.

(1) Note. The vertical component imparted to the wheel is caused by antifriction means provided on the reciprocable means or rotation of the wheel being engaged.

SEE OR SEARCH CLASS:

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclass 104 for lifting devices in the form of a wedge not limited to any specific art.

430 Ramp-type truck:

This subclass is indented under subclass 426. Devices in which the mobile support has an inclined way associated with it for directing a wheel onto said support.

SEE OR SEARCH THIS CLASS, SUBCLASS:

537+, for a self-loading or unloading vehicle having a conveyor of the skidway type.

431 ARTICLE ENGAGED BETWEEN ENDS FOR ROTATION AND ADVANCEMENT:
This subclass is indented under the class definition. Apparatus comprising a driven means for engaging an elongated article between its ends and causing said article to advance along its longitudinal axis and simultaneously to turn about said axis, no other movements being imparted to the article.

(1) Note. The article must be longer than any individual engaging means in the direction of advancing movement. See Class 198, Conveyors: Power-Driven, subclass 780 for live roll conveyors in which long rolls advance an article while turning it.

SEE OR SEARCH THIS CLASS, SUBCLASS:
14+, for apparatus for stock pulling or pushing by means engaging the stock at its ends.
433, for roller-type apparatus for merely rotating an article.
754+, for handling apparatus for simply turning an article about an axis and means for imparting complex movements to an article.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 2.1+, particularly subclasses 2.16+ for similar apparatus combined with bias cutting means.
72, Metal Deforming, subclasses 420+ for apparatus for feeding and/or rotating the work under a hammer.
74, Machine Element or Mechanism, appropriate subclasses, especially subclass 22 for similar apparatus, which drives a shaft or tool forming part of a machine rather than an article to be handled.
82, Turning, appropriate subclasses for similar apparatus combined with a turning tool means.
144, Woodworking, subclasses 208.1+ for similar apparatus combined with means for removing bark from a log.
173, Tool Driving or Impacting, appropriate subclasses, especially subclasses 145+ and 149 for tool advancing and rotating means.
198, Conveyors: Power-Driven, subclasses 373+ for a conveyor for changing the attitude of an item relative to its conveyed direction.
314, Electric Lamp and Discharge Devices, Consumable Electrodes, subclasses 41, 42, and 43 for electric lamp or discharge devices including means to advance and turn an electrode about its axis.
451, Abrading, e.g., subclass 189, apparatus similar to that of this subclass disclosed as advancing work while it is being abraded.

432 Driven, canted roll or ring:
This subclass is indented under subclass 431. Apparatus in which the driven means (e.g., a roll or an annulus) has a surface of revolution for contacting the article with the inner or outer side of said surface, the axis of said means being adapted to be obliquely disposed with respect to the longitudinal axis of the article and said means being driven about its axis whereby to cause the article simultaneously to advance and turn about its axis.

433 ARTICLE ROTATOR, ROLLER TYPE:
This subclass is indented under the class definition. Handling devices for rotating a discrete article about an axis of rotation passing through such article by peripheral contact thereof with means having rotary motion about its own axis of revolution and without transfer of such article from such means to another similar means.

(1) Note. A discrete article is one which is not a part of the apparatus and one which is of constant shape and moves as a whole without relative motion of its parts.

SEE OR SEARCH THIS CLASS, SUBCLASS:
403+, for a device for emptying a portable receptacle.
426+, for wheel and wheel-type handlers which include means for rotating same while being removed from or placed on an axle.

431+, for apparatus for rotating and advancing an elongated article along its axis by means engaging the article between its ends.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 373+ for a conveyor for changing the attitude of an item relative to its conveyed direction.
242, Winding, Tensioning, or Guiding, subclasses 541+ for a convolute winding machine with a particular peripheral roll drive, subclass 564.5 for an unwinding machine with a particular peripheral roll drive.
384, Bearings, subclass 548 for nonpowered roller anti-friction elements.
451, Abrading, subclasses 397+ for a work holder for an abrading machine which rotates the workpiece.

434 MOTION OR DRAFT RESPONSIVE LOAD HANDLER AND TRANSPORTER:
This subclass is indented under the class definition. Devices comprising a mobile support having mounted thereon load handling means capable of transferring a load to or removing a load from the support, or capable of grasping and supporting the load while being transported by the device and in which (a) the load-handling mechanism is designed to function in response to travel of the mobile support, or (b) the support is so constructed that tractive force applied to it will cause relative movement between the parts thereof, which in turn will cause the handling means to function.

SEE OR SEARCH CLASS:
74, Machine Element or Mechanism, subclasses 13+ for wheel-type power take off.

435 Moveably connected vehicle sections (e.g., articulated, etc.):
This subclass is indented under subclass 434. Devices in which the vehicular support comprises moveably connected frame sections, one of said sections carrying a load-handling means, and which sections are caused to move relative to each other by a tractive force applied to one of said sections to cause loading of the support or merely engagement of the load for transportation.

SEE OR SEARCH CLASS:
172, Earth Working, subclasses 238, 467, 588, and 605 for a shiftable hitch between a tractor and a trailing implement which causes movement of an implement part.

436 Vertically swinging:
This subclass is indented under subclass 435. Device in which the movable sections of the frame are connected for relative swinging movement in a vertical plane.

437 Ground engageable means:
This subclass is indented under subclass 434. Handling devices including means engageable with or anchored to the ground to cause operation of the load handling means upon movement of the vehicle.

438 Lifting leg type:
This subclass is indented under subclass 437. Devices in which the handling means comprises mechanism for elevating or lowering a load and has associated with it a rigid strut-like means engageable with the ground and reacting thereagainst to cause operation of the load-handling means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
498+, for a self-loading or unloading vehicle having a separable load rack, and wherein the rack is sometimes provided with extensible, leg-like elements.

SEE OR SEARCH CLASS:
172, Earth Working, subclasses 205 and 236+ for earth working apparatus comprising a ground enagaging lever for manipulating a part of the apparatus.

439 Wheel operated:
This subclass is indented under subclass 437. Load handlers in which the load-handling means is operated by a ground wheel which supports or aids in supporting the organization.

SEE OR SEARCH CLASS:
56, Harvesters, for miscellaneous agricultural implements which are operated

or driven from the wheels of the device, and see subclasses 327.1+ for devices for collecting severed or harvested plants or portions of plants resting on the ground and which may be driven from a traction wheel.

171, Unearthing Plants or Buried Objects, subclasses 63+ for apparatus for collecting small stones resting on or partially embedded in the soil and which may be driven by a tractor wheel, and subclass 108 for traction wheel driven apparatus for recovering and separating buried objects from the ground.

172, Earth Working, subclasses 105+, 402, 403+, 407-411, and 521 for earth working apparatus with means driven from a rolling ground wheel.

212, Traversing Hoists, subclass 169 for traversing hoist devices driven by the wheels of the vehicular mount.

222, Dispensing, subclass 614 for ambulant ground wheel operated dispensing means.

440 Locked to wheel:

This subclass is indented under subclass 439. Wheel operated devices in which the load-handling means (a) is fixed to or constitutes part of the wheel of the vehicle or the axle therefor for rotation therewith; or (b) is capable of being coupled directly to the wheel for rotation therewith.

441 Elevator type:

This subclass is indented under subclass 439. Wheel operated devices in which the load carrier is guided during rectilinear movement in a vertical or inclined path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

540+, for a self-loading or unloading vehicle wherein the load or load holder moves in a path which includes vertical, rectilinear movement.

592+, for an elevator or hoist having a loading or unloading means.

442 Vertically swinging support:

This subclass is indented under subclass 439. Wheel operated devices in which the load handling means comprises a vertically swinging member which includes load pick-up or discharge means and is adapted to move the load through an arcuate path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

680+, for miscellaneous vertically swinging type load handlers.

443 Cable and drum actuated:

This subclass is indented under subclass 442. Wheel operated vertical swinging load-handling devices in which the power derived from the wheels is applied through a drum and cable arrangement to swing the member about a fulcrum.

444 TILTING VEHICLE-TYPE HANDLER (I.E., PORTABLE GRAPPLE):

This subclass is indented under the class definition. Handling devices consisting of a wheeled framework designed to be tilted or rocked in its entirety in a vertical plane about an axis of rotation of its wheels to function as a single throw lever in picking up a load for transportation thereby and having means mounted thereon for grasping or hooking a load to fix its position relative to the frame-work to facilitate picking up or elevating a load.

SEE OR SEARCH THIS CLASS, SUBCLASS:

618+, for elevating devices having means for grasping or seizing a load.

729+, for vertically swinging supports having load-grasping means.

SEE OR SEARCH CLASS:

248, Supports, subclasses 500+ for similar devices used to hold a load down upon a supporting surface.

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 120+ for miscellaneous single throw lever devices designed for applying a force to an object. These devices may be supported on wheels for movement to or from a point of use.

280, Land Vehicles, subclass 43.1 for a vehicle having vertically adjustable ground engaging means and which is unstable when in transporting position but which is stabilized by an attendant or an article to which the vehicle is

temporarily attached, and subclasses 47.24+ for two-wheeled hand trucks, especially subclass 47.27 for warehouse-type trucks which have a shelf-like toe, which is not considered a load hooking means, and subclass 100 for devices for merely securing a load to a vehicle.

294, Handling: Hand and Hoist-Line Implements, appropriate subclasses for miscellaneous hand or hoist line grapples.

445 Article actuated engaging means:
This subclass is indented under subclass 444. Tilting vehicle handlers having means thereon which through engagement with the load, actuates the load-grasping mechanism.

446 Separable load rack:
This subclass is indented under subclass 444. Tilting vehicle handlers in which the load-handling means is in the form of a rack or framework which is separable from the wheeled framework and designed to be readily engaged thereby.

SEE OR SEARCH THIS CLASS, SUBCLASS:

498+, for self-loading or unloading vehicle having a separable load rack.

608, for elevator or hoist-type devices having a separable load rack.

447 Successive engaging means:
This subclass is indented under subclass 444. Devices in which article engaging means are spaced apart on the framework and so related that rocking of the vehicle in opposite directions will permit or cause the engaging means to successively "lay hold" of the load for transportation.

448 With band-type engager:
This subclass is indented under subclass 444. Tilting vehicle handlers in which the article engaging means is adapted to pass from one side of the vehicle continuously around the load to the other side of the vehicle to hold the same relative to the vehicle for movement therewith.

SEE OR SEARCH THIS CLASS, SUBCLASS:

460, for straddle-type handlers having band-type article engaging means.

SEE OR SEARCH CLASS:

248, Supports, subclasses 500+ as noted in subclass 444 above.

280, Land Vehicles, subclasses 100+ for similar devices for securing a load to a vehicle.

449 Flexible strand attached load gripper:
This subclass is indented under subclass 444. Grappling devices in which the load grasping means is attached to the running gear by means of a flexible strand.

450 Opposed movable jaw grippers:
This subclass is indented under subclass 444. Devices in which the load grasping means comprises a plurality of load engaging jaw elements, each of which is mounted on the running gear for clamping movement toward another jaw portion to grasp the load therebetween.

(1) Note. Movement of a jaw portion about an axis of the supporting wheels is not considered "clamping movement" as used above.

SEE OR SEARCH CLASS:

294, Handling: Hand and Hoist-Line Implements, subclasses 86.4+ for miscellaneous grapples, particularly subclasses 106+ for pivoted jaw type.

451 Slidable:
This subclass is indented under subclass 450. Grippers in which the jaws are slidably mounted for translatory movement relative to each other to grasp an article.

452 Toggle-type operator:
This subclass is indented under subclass 450. Grippers in which the means for actuating the jaws includes a toggle mechanism or has a toggle-like function.

453 Single movable jaw gripper:
This subclass is indented under subclass 444. Devices in which the load seizing means comprises a single movable load-engaging jaw portion having clamping movement toward a fixed load-engaging portion on the running gear to clamp the load therebetween.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclasses 103.1+ for hand or hoist line grapples having a fixed and movable jaw.

454 With operating means:
This subclass is indented under subclass 453. Devices in which means are provided for mechanically manipulating, locking, or releasing the movable jaw.

(1) Note. A rigid extension in the gripping jaw in the form of a handle is considered part of the jaw and therefore does not constitute a control means of the type here classified.

455 Adjustable:
This subclass is indented under subclass 453. Devices in which the gripper jaw is so constructed and/or mounted on the wheeled framework as to adapt it for engagement with various sized objects.

(1) Note. A pivotal mounting for a hook does not render it adjustable.

SEE OR SEARCH THIS CLASS, SUBCLASS:
449, for load-gripping or hooking means affixed to the wheeled framework by means of a flexible strand whose length may be varied.

456 Slidable:
This subclass is indented under subclass 455. Adjustable devices in which the gripper jaw is capable of continuous bodily sliding movement lengthwise of the wheeled framework to different positions of adjustment.

457 Rigid-type grapple engaging means (e.g., hooks, etc.):
This subclass is indented under subclass 444. Devices in which relatively rigid load-engaging means, usually a hook-like element or elements are carried by the running gear and arranged to hook or frictionally engage and support an article by merely engaging a collar or shoulder portion or entering an opening formed in the article.

(1) Note. Handles or receptacles provide shouldered portions for engagement by the hook-like elements.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclasses 90+ for collar engaging type grapples.

458 OPPOSED SHELF-TYPE ELEVATOR AND TRANSPORTER:
This subclass is indented under the class definition. Devices comprising an open mobile framework adapted to receive within its confines a load to be handled, and load-handling means comprising spaced load engaging elements positioned adjacent to opposed portions of said framework, which handling means provides oppositely positioned shelf-like load-engaging portions adapted to engage therebetween the load and elevate it for subsequent transportation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
426+, for vehicles of this type adapted to engage, support, and transport wheel-type articles while in upright position.

459 Load bridging vehicle:
This subclass is indented under subclass 458. Devices in which the mobile support for the handling means is arch-shaped and vertically disposed so as to be able to straddle the load from above.

SEE OR SEARCH THIS CLASS, SUBCLASS:
460+, for load bridging trucks having other than shelf-type load-engaging means.

460 LOAD BRIDGING VEHICLE:

This subclass is indented under the class definition. Devices comprising a rigid wheeled support having mounted thereon load handling means (a) in which the support is arch-shaped in a vertical direction to receive the load within its confines for engagement by the handling means, or (b) in which the support is mounted in an elevated position on its wheels and the handling means is so positioned on the support as to engage a load positioned therebelow for transportation thereby and usually having (a) means supplementing the load handling means for securing the load in fixed position relative to the wheeled support during transit, or (b) means for receiving the weight of the load from the handling means to support it during transportation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

447, for tilting load-bridging vehicles which are rocked to engage a load.

459, for load-bridging vehicles with opposed shelves for handling the load.

SEE OR SEARCH CLASS:

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 2+ for hoisting trucks; and subclass 324 for a rotatably driven, cable-pulling drum mounted on a vehicle having an arch-shaped body for straddling a load.

461 Removable transverse load support:

This subclass is indented under subclass 460. Devices in which the supplemental means is in the form of a load bearing support extending below and crosswise of the load from one side of the wheeled support to another in the form of a saddle, sling, or platform to receive the weight of the load during transit.

462 VEHICLE ATTACHED AUXILIARY CARRIERS:

This subclass is indented under the class definition. Devices in which a vehicle is provided with a carrier or support for an auxiliary load, the carrier or support being movable at least in part from its normal load carrying position to a loading or unloading position to thereby facilitate or permit placement of the load thereon or removal therefrom and the load being shifted from one position to the other while on the support.

(1) Note. The vehicle must be capable of carrying the auxiliary load while also carrying or drawing the primary load. The primary load may be passengers.

SEE OR SEARCH THIS CLASS, SUBCLASS:

467+, for a self-loading or unloading vehicle.

680+, for vehicles having a vertically swinging load support for a primary load.

SEE OR SEARCH CLASS:

224, Package and Article Carriers, subclasses 277+ for vehicle attached carriers which may be movable for purposes other than loading or unloading.

463 For rim, tire, or wheel:

This subclass is indented under subclass 462. Devices which are specially constructed to receive a wheel, rim and/or tire.

SEE OR SEARCH THIS CLASS, SUBCLASS:

426+, for mobile supports for holding a wheel by its outer circumference in an upright position for assembly with or disassembly from an axle.

SEE OR SEARCH CLASS:

224, Package and Article Carriers, subclasses 42.12+ for vehicle attached carriers for rims, tires, or wheels, and especially subclass 42.21 for such carriers which are moveably mounted for purposes other than loading or unloading.

464 Plural:

This subclass is indented under subclass 463. Devices in which distinct means are provided for receiving each of a plurality of wheels, tires, and/or rims.

(1) Note. The carriers may move individually or in unison.

SEE OR SEARCH CLASS:

224, Package and Article Carriers, subclasses 42.15+ for plural vehicle attached carriers for rims, tires, or wheels which may be moveably mounted for purposes other than unloading, as, for example, moving the first carrier for the sole purpose of gaining access to the second carrier.

465 Movement about spaced pivot axes:

This subclass is indented under subclass 463. Devices in which the carrier or support is mounted to partake of independent pivotal movement about at least two axes which do not intersect.

466 Simple arcuate or rectilinear movement:

This subclass is indented under subclass 463. Devices in which the carrier or support is mounted for simple movement about a fixed axis or is moveably mounted in rectilinear guides.

467 SELF-LOADING OR UNLOADING VEHICLES:

This subclass is indented under the class definition. Devices in which a vehicle has a load receiving and transporting portion and handling means carried by such vehicle adapted (a) to deposit a load into or remove a load from said receiving portion, or (b) to transfer such load to a position for subsequent transfer into said receiving portion.

(1) Note. Where the handling means is of the Class 193 or Class 198 type, the load may remain on the handling means rather than be deposited into or removed from the load receiving or transporting portion. This exception to the line has been permitted because of the similarity of these devices to those in which manual transfer of the load from the conveyor to the vehicle body is provided for in (b) of the subclass definition, and because no appropriate classification is available in Classes 193 and 198.

(2) Note. The combination of a vehicle having a load receiving and transporting portion and a load therefor, which load is capable of moving itself to or from the vehicle, is found in this and the indented subclasses. A combination of this nature is placed here, rather than in one of the areas commencing with subclass 333 and ending with subclasses 373+, above, on the rationale that there is no means involved which is always external of the vehicle (i.e., after loading has been accomplished, nothing external of the vehicle remains).

(3) Note. A vehicle having a loading or unloading means which is disclosed as relying on an external source of power to operate it, but which source is not claimed, is classified here (e.g., a vehicle having a load moving means operated by a cable connected to an external pulling device, but wherein only the cable is claimed); however, if the external source of power is claimed as such, then classification is in one of the areas beginning with subclass 333 and concluding with subclasses 373+.

(4) Note. Occasionally, the classification of a patent to a vehicle and a means external of the vehicle for cooperating in the loading or unloading of the vehicle may be in this area (467+) rather than in those subclasses beginning with 333 and concluding with 373+. Consider the instance of a vehicle #1 for transporting a load, which vehicle has located thereon another vehicle #2 for transporting increments of the load of vehicle #1 while loading or unloading that vehicle - assuming that there is a means external to vehicle #2 (although not external to vehicle #1) which cooperates in the loading or unloading of vehicle #2, the apparatus nevertheless does not amount to more than a self-loading or unloading vehicle for this area (467+), which fact should not be obscured by classifying the patent in any of the superior subclasses previously mentioned.

SEE OR SEARCH THIS CLASS, SUBCLASS:

333, 334+, 337, 338, 339, 340+, 349+, 352+, 354+, and 373+, for various combinations of one or more, moving or stationary, wheeled (except that

subclass 373 omits this limitation), load-transporting type vehicles, and an external means of some nature for loading or unloading, or cooperating in the loading or unloading of, the vehicle. Also see (3) Note, above for a further explanation of what may comprise an external means for these subclasses (333, etc.).

430, for a vehicle having a ramp for directing a wheel onto the vehicle.

434+, for a vehicle having a loading mechanism which is motivated by motion of the vehicle.

444+, for vehicles which have grasping or hooking means and tilt in order to pick up a load for transportation.

458+, for vehicles which receive a load within them and have load-handling means comprising spaced shelves.

460+, for vehicles which straddle the load for loading the vehicle.

462+, for a vehicle having a movable carrier or support for an auxiliary load, which load is in addition to the vehicle's primary load.

618+, for vehicle with an elevating carrier comprising a grab and in which there are no additional handling means for depositing or removing a load from the grab.

680+, especially 728, for vehicles with vertically swinging load supports which pick up and transport material without transferring it.

812, for a process of charging or discharging a self-loading or unloading vehicle.

SEE OR SEARCH CLASS:

37, Excavating, subclasses 304+ for a vehicle having means for excavating material and for loading itself with the material.

105, Railway Rolling Stock, subclasses 239+ for railroad vehicles having means thereon for producing a gravity dump of the vehicle contents.

108, Horizontally Supported Planar Surfaces, subclasses 51.11+ for an industrial platform.

212, Traversing Hoists, appropriate subclasses for vehicles having a traversing hoist capable of transferring a load from one location external of the vehicle to another external location, and also capable of depositing a load on an extension of the mounting platform.

244, Aeronautics and Astronautics, subclass 137.1 for devices and arrangements for loading or unloading a vehicle of the aircraft type, which devices, etc., may include means for moving a load to or from the aircraft.

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 2+ for vehicles having a platform load support and mechanism for raising and lowering it; and subclasses 279+ and 325+ for vehicles having at least one rotatably driven drum for pulling on a load hauling or hoisting cable.

280, Land Vehicles, subclass 401 for articulated vehicles so constructed that one section thereof is movable to a position upon another section for transportation thereby, and subclasses 47.12 and 47.17+ for vehicles loaded by mere tilting of the vehicle body as in the common hand truck.

298, Land Vehicles: Dumping, appropriate subclasses for roadway vehicles in which the unloading is effected by mere tilting of the vehicle body, or by combined sliding and tilting, etc., or where effected by unlatching or withdrawing of gates or doors or other like gravity unloading means; see also the reference to Class 298 in subclass 469 of this class (414).

468 With load-receiving portion comprising horizontally disposed, rotatable cylinder:

This subclass is indented under subclass 467. Apparatus wherein the load receiving portion is in the form of a cylinder which is located in a generally horizontal position and has means to rotate it about its longitudinal axis, and the handling means comprises one or more devices for moving material into, within, or out from the cylinder, at least one of which devices (a) derives its movement from the rotation of the cylinder and (b) imparts movement to the material in a direction longitudinally of the cylinder.

(1) Note. The one device typically is a spiral vane affixed to the inner wall of the cylinder.

(2) Note. The rotation of the cylinder frequently is reversible for the purpose of changing the direction of movement of the material moved by the one device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

467, for a load-receiving portion which is rotatable, but for some other purpose than that of this subclass; e.g., to place a door, which is located in the periphery of the portion, in a position whereby a load within the portion may exit by gravity.

469 With load-receiving portion, or significant section thereof, pivotable relative to horizontal:

This subclass is indented under subclass 467. Apparatus wherein the handling means comprises enabling the load-receiving portion, or at least a significant part of the portion, to move in an arcuate path relative to a generally horizontal plane, and thus impart a change in the attitude of the portion relative to that plane, for facilitating the loading or unloading of the vehicle.

(1) Note. This and the indented subclasses constitute, principally, a reclassification of subclasses 501 and 505-511 of former Class 214 (subclasses 502-504 of that class, now subclasses 471-473, having been left as they were, except for being screened for conflicting subject matter). While the art of the 501 and 505-511 area consistently included a load-receiving portion pivotable about a horizontal axis, as required by former subclass 501, it occasionally lacked the "handling means" of its outdent, former subclass 500, now subclass 467. Accordingly, in order to avoid a significant redistribution of the subclasses 501+ art, this subclass (469) has been defined in such a manner as to identify the pivoting of the load-receiving portion as constituting the handling means. In addition, certain of the subclasses indented hereunder were established in order to provide for specific types of devices which conventionally are construed to be "handling means".

(2) Note. "Load-receiving portion", as used herein, denotes the one or more elements, members, etc., of a vehicle which supports a load during transit, as distinguished from an element, etc., which supports a load only during the loading or unloading of the vehicle.

(3) Note. "Generally horizontal plane" usually is descriptive of the surface from or to which a load moves to or from the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

349+, 354+ and 373+, for the combination of a vehicle, or portion thereof, and means external of the vehicle for changing the attitude of the vehicle, or portion, for a vehicle loading or unloading purpose.

495+, for a vehicle having a raisable or lowerable load-receiving portion and wherein, but only for the purpose of facilitating its movement to or from an elevated position, the portion may undergo pivotable movement of the kind provided for in this subclass (469).

545, and 556+, for a self-loading or unloading vehicle having other loading or unloading means, which means may be, in the former subclass, a vertically rectilinearly movable component of the load-receiving portion, or, in the latter subclass, a curvilinearly movable component of the load-receiving portion; also, see the latter subclass (556) for an explanation of the relationship between the art of that subclass and the art of this subclass (469).

575+, for an external means subcombination of the type of combination described in the search note above to subclasses 349+, 354+ and 373+.

629, 631+, 641+, and 663+, for a portable (e.g., vehicle-mounted) elevator or hoist having a load carrier which is

movable relative to the vehicle, which movement may include pivoting about a more or less horizontal axis.

SEE OR SEARCH CLASS:

37, Excavating, subclasses 412+ for an excavating device in the nature of a scoop which is provided with ground engaging wheels and wherein the scoop may be mounted for moving pivotably about a horizontal axis for acquiring, or relieving itself of, a load.

298, Land Vehicles: Dumping, appropriate subclasses for a vehicle of the kind proper for that class which is so constructed that, by manipulation of the vehicle or a portion thereof, a load will move by gravity from the vehicle. It is not possible to state, at the time of this reclassification, a definitive line between Class 298 subject matter, on the one hand, and some of the art which appears in certain of the subclasses of this area, particularly in this subclass (469), on the other hand.

470 Having axis of pivot parallel to longitudinal axis of vehicle for side loading or unloading:

This subclass is indented under subclass 469. Apparatus wherein the movement of the load-receiving portion takes place about an axis which is parallel to the longitudinal axis of the vehicle.

471 Elevatable type:

This subclass is indented under subclass 469. Pivoted load receivers in which means are provided for elevating the load receiver and its pivotal axis so as to vary the point of charging and/or discharging.

SEE OR SEARCH CLASS:

298, Land Vehicles, Dumping, subclass 11 for gravity dump vehicles having means for elevating and tilting the vehicle load carrying body.

472 Discharge gate-carried loading means:

This subclass is indented under subclass 469. Devices in which the loading or unloading means is carried by a discharge gate of the load receiver, and is movable therewith.

(1) Note. The mount for the handling means is normally swung to clear the path of the material in the dumping operation.

473 Interrelated movements or drives for load body and loading means:

This subclass is indented under subclass 469. Devices comprising (a) means preventing operation of the loading means during movement of the tilting body, (b) means controlling the operation of the tilting body by predetermined position of the loading means, or (c) means causing simultaneous operation of the tilting body and loading means.

(1) Note. Valves, clutches and similar mechanism for providing a selective drive for either the tilting body or the loading means are not considered an "interlock" of the type classified here.

474 By adjustably attaching element of running gear (e.g., wheel, axle, etc.) to load-receiving portion, or support member (e.g., chassis, frame, etc.) therefor, to enable relative movement therebetween:

This subclass is indented under subclass 469. Apparatus wherein the means enabling pivotable movement includes structure for connecting one or more elements of the running gear of the vehicle to the load-receiving portion, or to a member of the vehicle which serves to support the portion, in such a manner that the element may move relative to the portion (or member), or vice versa.

(1) Note. "Adjustable", as used herein, is intended to include, as well, the removal of an element of the running gear.

(2) Note. "Running gear" does not include a vehicle attachment (e.g., dolly, truck, etc.) which is placed in a ground-engaging position only when it is desired to stabilize the vehicle (e.g., a trailer) in its nontransit mode.

SEE OR SEARCH CLASS:

280, Land Vehicles, subclasses 80.1+ for a wheeled vehicle of that class and its running gear.

475 Element shiftable linearly toward front or rear of vehicle:
This subclass is indented under subclass 474. Apparatus wherein the adjusting of the element involves movement in a straight line forwardly or rearwardly of the vehicle from its usual position relative to the load-receiving portion.

476 Pivotably:
This subclass is indented under subclass 474. Apparatus wherein the adjusting of the element involves movement of a curvilinear nature about an axis.

477 Load-receiving portion also shiftable longitudinally:
This subclass is indented under subclass 469. Apparatus wherein the load-receiving portion is mounted for movement also in a direction parallel to the longitudinal axis of the vehicle, which movement may occur before, during, or after the pivotable movement of the portion.

(1) Note. The weight of the load may cease to remain on the portion even though the load remains in proximity thereto (e.g., as in the instance of unloading a boat into a body of water).

478 With driven means to move load relative to portion:
This subclass is indented under subclass 477. Apparatus wherein the vehicle includes means of a driven nature to move a load in relation to the load receiving portion.

479 Means serves also to shift portion in at least one direction:
This subclass is indented under subclass 478. Apparatus wherein the powered means also is the drive means for moving the portion in one or the other, or both, of its directions of longitudinal movement.

480 Load-receiving portion includes means which extends longitudinally therefrom to form ramp when portion pivots:
This subclass is indented under subclass 469. Apparatus wherein the load-receiving portion is provided with a means which can be extended (often telescopically) so as to be, when the portion is in its pivoted attitude, in close proximity to the surface from or to which a load is to be moved.

(1) Note. Patents are placed herein without regard to whether the means continues to support the load after the means returns to its nonoperative position, since it is not always possible to clearly identify which structural elements are bearing the weight of the load after the vehicle has been loaded.

481 Trailer-type vehicle and adjustable or removable tow-engaging structure associated therewith enabling lowering of forward end of vehicle for loading:
This subclass is indented under subclass 469. Apparatus wherein the vehicle is of a kind which is intended to be towed and has its wheels located in the vicinity of that end which is opposite to its usual direction of travel, and wherein there is provided structure (e.g., a separable connector of the "gooseneck" type, a reconfigurable forward extremity of the vehicle, etc.) for connecting the vehicle to a towing vehicle and pivotably lowering the forward end of the vehicle, relative to its rearward end, to facilitate the loading or unloading of the vehicle.

(1) Note. The towing vehicle ordinarily is of a "tractor" type and is provided with a "fifth wheel" for supporting the tow-engaging structure.

(2) Note. The vehicle of this subclass, often a trailer of "low-boy" kind, ordinarily is intended to have a load driven, or otherwise move, thereonto or therefrom by way of its forward end when the latter is in its lowered position.

482 Trailer-type vehicle having load-receiving portion pivotable relative to at least one other component of vehicle:
This subclass is indented under subclass 469. Apparatus wherein the vehicle is of a kind which is intended to be towed and wherein the pivotable movement of the load-receiving portion relative to the horizontal is relative also to one or more other elements of the structure of the vehicle; i.e., the vehicle is other than a simple, two-wheel trailer wherein the only manner in which the load-receiving portion can be piv-

oted is by raising or lowering the tow-engaging end of the vehicle.

483 About joint or other connection in structure (e.g., drawbar, frame, etc.) normally extending linearly, or planarly, from tow-engaging end of vehicle to axis of wheels of vehicle, and relative to said end:
This subclass is indented under subclass 482. Apparatus wherein the structure which transmits pulling force from the forward (i.e., towing-vehicle-engaging) end of the vehicle to the region of its ground-engaging wheels, which structure appears as a straight-line or a plane when in a pulling mode, includes an axis of pivot within its length, whereby the load-receiving portion is pivotable relative to said forward end.

484 About axis located between or adjacent to wheel sets of vehicle having plural, tandemly arranged sets of rear wheels, and relative to tow-engaging end of vehicle:
This subclass is indented under subclass 482. Apparatus wherein the vehicle has two or more sets of rearwardly-located, ground-engaging wheels, the axis of rotation of each set being spaced longitudinally of the vehicle from the corresponding axis of any other set, and wherein the load-receiving portion is pivotable, relative to the forward end of the vehicle, about an axis located either between two of the sets of wheels or adjacent to one such set.

485 About axis of wheels of vehicle having two wheels, and relative to tow-engaging end of vehicle:
This subclass is indented under subclass 482. Apparatus wherein the vehicle has two laterally spaced wheels having a common axis of rotation, and wherein the load-receiving portion is pivotable, relative to the forward end of the vehicle, about an axis which is coincident with said axis of rotation.

486 With means to raise load above load-receiving portion for deposit thereon or therein:
This subclass is indented under subclass 469. Apparatus wherein the vehicle includes means to lift, hoist, or otherwise elevate a load to a height where it can be released to move by gravity to the vehicle's load-receiving portion or otherwise moved thereto.

487 Including receptacle-like (e.g., bucket, scoop, etc.) holder for load:
This subclass is indented under subclass 486. Apparatus wherein the means to lift etc., a load includes at least one member of a kind which partially encloses the load being moved thereby.

488 Comprising driven conveyor:
This subclass is indented under subclass 486. Apparatus wherein the means to lift, etc., a load comprises a carrier of the driven conveyor type.

489 With driven conveyor to receive load departing from pivoted load-receiving portion:
This subclass is indented under subclass 469. Apparatus wherein the vehicle includes a conveyor of the driven type to receive and carry away a load which is moving by gravity from the vehicle's load-receiving portion, which portion has moved to an attitude wherein it is inclined to the horizontal.

490 Two wheel, manually propelled vehicle pivotable about axis of wheels (e.g., hand truck, etc.) and provided with attendant-operated, load-handling means:
This subclass is indented under subclass 469. Apparatus wherein the vehicle comprises a load-receiving portion provided near one of its extremities with a pair of wheels spaced apart along a common axis of rotation and provided near an extremity with means (e.g., hand grip) to facilitate its movement by an attendant, and wherein the arcuate path of movement of the portion, or at least part of movement of the path, takes place about the axis of wheel rotation, and wherein the vehicle is further provided with means for operation by the attendant to assist in its loading or unloading.

SEE OR SEARCH THIS CLASS, SUBCLASS:

370+, for a vehicle of the hand truck type which is provided with means for grasping or hooking a load relative to the framework of the vehicle to facilitate picking up or elevating the load.

SEE OR SEARCH CLASS:

280, Land Vehicles, subclasses 47.24+ for a tiltable vehicle, stabilized by an attendant, and having laterally spaced wheels.

491 With driven means to move load relative to load-receiving portion:

This subclass is indented under subclass 469. Apparatus wherein the vehicle includes means of a driven nature to move a load in relation to the load-receiving portion.

SEE OR SEARCH THIS CLASS, SUBCLASS:

679, for an explanation of the relationship between the subject matter of that subclass and some of the art of this subclass (491).

492 Including pusher element:

This subclass is indented under subclass 491. Apparatus wherein the driven means includes an element, rigid or flexible, which element engages that portion or surface of a load which is opposite the leading portion or surface thereof, and to which element a pushing or pulling force is applied in order to push the load relative to the load-receiving portion.

493 Pivotably mounted element:

This subclass is indented under subclass 492. Apparatus wherein the element is mounted for swinging about an axis and is driven (e.g., rotatably, oscillatably, etc.) thereabout.

494 Including haulage cable:

This subclass is indented under subclass 491. Apparatus wherein the powered means includes an elongated, flexible element for pulling a load.

495 Having elevating load body:

This subclass is indented under subclass 467. Vehicles in which the load-receiving portion of the vehicle is translated in a vertical or inclined path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

592+, for an elevator or hoist and a loading or unloading means therefor, and see the search notes thereto for a discussion of the relationship of that subclass (592) and this one.

496 With traversing hoist:

This subclass is indented under subclass 495. Devices in which the load handling means is in the form of a traversing hoist of the type classifiable in Class 212.

497 With reciprocating conveyor (e.g., ejector type etc.):

This subclass is indented under subclass 495. Devices in which the load handling means is in the form of a reciprocating conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

506, for a self-loading or unloading vehicle having a winch and an idler-pulley-traversing haulage cable for ejecting a load from the vehicle.

509+, for a self-loading or unloading vehicle having a reciprocably movable conveying element for ejecting a load from the vehicle.

659+, for an elevator (including a portable one) or hoist and a loading or unloading means therefor, and wherein the means comprises a device on the carrier of the elevator or hoist for moving a load laterally thereto or therefrom.

498 Separable load rack:

This subclass is indented under subclass 467. Vehicles having a separable load rack or the like in which means are provided on the vehicle or the rack to facilitate movement of the load carrying portion of the vehicle.

(1) Note. The rack is not integrated into the vehicle structure and is adapted to be completely separated from the vehicle when unloaded therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

446, for tilting vehicle handlers having separable load racks.

522, for platform type conveyors movable into or out of a vehicle where the platform is normally part of the vehicle.

608, for elevator or hoist devices having separable load racks.

728, for vehicles having vertically swinging racks integrated therein which also have translatory movement.

499 Conveyor operated:
This subclass is indented under subclass 498. Devices in which power operated conveyor means are provided on the vehicle for moving a separable load unit onto or off a vehicle.

(1) Note. The conveying means found in this subclass is the type classified in Class 198.

SEE OR SEARCH THIS CLASS, SUBCLASS:
507+, for a self-loading or unloading vehicle wherein the load-handling means comprises a conveyor.

500 Cable operated:
This subclass is indented under subclass 498. Devices in which the means for moving the load rack to or from the vehicle body comprises a cable arrangement.

501 Successive handling means:
This subclass is indented under subclass 467. Self-loading vehicles in which the charging or discharging means comprises a plurality of distinct powered handling mechanisms adapted to successively handle a load in transferring it to or from the load receiving body of a vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
507, for plural conveyors arranged to jointly convey a load.
564, through 571, for miscellaneous combined carriers not adapted to load or unload a vehicle.

SEE OR SEARCH CLASS:
100, Presses, appropriate subclasses for presses which may, when used on a vehicle, inherently function to load or unload the vehicle. See the class definition, section V of Class 100.

502 Power-driven conveyors:
This subclass is indented under subclass 501. Devices in which the loading or unloading means includes a plurality of conveyors of the type classifiable in Class 198 and/or Class 302, or any combination of two such conveyors.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 570+ for a conveying system having plural power-driven conveying sections.
406, Conveyors: Fluid Current, subclasses 51+ for conveying systems including a fluid current conveyor and a diverse type conveyor.

503 Moveably mounted:
This subclass is indented under subclass 502. Conveyor arrangements in which at least one of the conveyors is moveably mounted on the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
523, for a self-loading or unloading vehicle wherein the load handling means comprises a conveyor which is shiftably or removably attached to the vehicle.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 586+ for a conveying system having plural power-driven conveying sections, and wherein the sections are relatively adjustable.

504 Universally:
This subclass is indented under subclass 503. Vehicles in which the moveably mounted conveyor is capable of swinging movement in more than one plane.

505 Pivotally:
This subclass is indented under subclass 503. Vehicles in which the moveably mounted conveyor has swinging movement about a fixed axis.

506 Winch and idler-pulley-traversing haulage cable for ejecting load from vehicle:
This subclass is indented under subclass 467. Apparatus wherein the handling means comprises a winch and a strand-like or chain-like member having one of its ends attached to the winch and having its other end (a) passed around a pulley for reversing its direction of

movement when the one end is wound upon the winch, and (b) attached to a load located on the load receiving portion, whereby the member serves to pull the load off the portion.

(1) Note. The winch and member, but not the pulley, frequently are utilized to pull a load onto the portion.

507 Conveyor:
This subclass is indented under subclass 467. Vehicles carrying some type of conveyor to load or unload them.

(1) Note. In accordance with (1) Note under the definition of subclass 467, vehicles which have conveyors or skids of the Class 193 or 198 type for loading or unloading them are classified in this or indented subclasses even though the load is not shifted from the conveyor or skid.

(2) Note. This area represents a revision of subclasses 83+ of former Class 214 to the extent of adding subclasses 509+ (derived in large part from former subclass 82) and reclassifying subclass 529 (formerly subclass 84). While subclasses 518, 521, and 525 (formerly subclasses 83.14, 83.22 and 83.3, respectively) have been screened for subject matter for subclasses 509+, subclasses 507, 508, 518 to 528, 537, and 538 are otherwise unchanged from their predecessor subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:
491+, for a self-loading or unloading vehicle having a load-receiving portion which is pivotable relative to the horizontal, and having also a driven means to move a load relative to the portion.
502+, for a self-loading or unloading vehicle wherein the load-handling means comprises two or more power-driven conveyors which engage the load successively.
813, for a process of charging or discharging a self-loading or unloading vehicle including a conveying means.

SEE OR SEARCH CLASS:
37, Excavating, subclasses 304+ for a self-loading vehicle of that class having a conveyor, and see the reference to that class (37) in subclass 467 above.
239, Fluid Sprinkling, Spraying, and Diffusing, subclass 672 for a container for nonfluid material and means to scatter or strew the material and having a conveyor or follower type unloader to feed or force the material to the scatterer from the container.

508 With worker support:
This subclass is indented under subclass 507. Vehicles having a support for a person carried thereby in working relation to the conveyor.

(1) Note. The supports are provided primarily to facilitate the placing of commodities on the conveyor by a person stationed on the support.

SEE OR SEARCH CLASS:
280, Land Vehicles, subclass 29 for combinations of seats and vehicles with running gear, especially subclass 32.5 for supports for persons engaged in manual labor adjacent to the ground.
296, Land Vehicles: Bodies and Tops, subclass 64 for combinations of seats and vehicle bodies.
297, Chairs and Seats, subclass 43 for a bottom and a back which fold laterally against a fixed standard.

509 Comprising load-engaging element reciprocably movable parallel to generally horizontal load-supporting component of vehicle for ejecting load therefrom:
This subclass is indented under subclass 507. Apparatus wherein the conveyor comprises a load-engaging element (e.g., a pusher plate), which is caused to move back and forth in a direction, which is approximately parallel to a load-supporting component of a vehicle (e.g., the floor of a truck body), which component has a generally horizontal attitude, for the purpose of removing a load from the portion.

(1) Note. While the claims of the art in this and the indented subclasses may not

always bring out clearly the actual departure of the load from the vehicle, the disclosure should leave no doubt that the intent is to discharge, not merely reposition, the load.

SEE OR SEARCH THIS CLASS, SUBCLASS:

258+, for apparatus for charging or discharging a facility comprising one or more sites for the parking of wheeled vehicles, which apparatus includes a means for exerting a generally horizontal force for transferring a vehicle to or from a carrier from or to a site.

280, for plural, static structures for supporting discrete loads and a charging or discharging means therefor, and wherein the structures comprise load-underlying members, and the means includes a load sustaining surface and a push-pull mechanism to transfer a load, with a horizontal component of movement, from one of the members to the surface or vice versa.

374, for the concept of unloading a moving vehicle by utilizing the momentum of the load.

390+, for a driven external means for unloading a wheeled, load-transporting type vehicle, especially subclass 393 for removing a load by means of a flexible, load-underlying member which raises the load and moves it laterally.

395+, for removing a load by a pushing or pulling means.

416.04 and 416.09-416.12, for a device for emptying a portable receptacle, which device includes means for pushing or ejecting the contents of the receptacle therefrom.

491+, for a self-loading or unloading vehicle having a load receiving portion which is pivotable relative to the horizontal, and wherein is provided a driven means for moving a load relative to the portion which movement may include removal from the portion.

497, for a self-loading or unloading vehicle having an elevatable load receiving portion and a load-handling means of the reciprocating conveyor type.

539+, for a self-loading or unloading vehicle having other loading or unloading means, and especially subclass 539 if the path of travel of the means represents an unprovided-for type of movement.

585, for the subcombination of a means, external to a vehicle, for the purpose of loading or unloading the vehicle, which means includes a load-engaging surface for pushing or pulling a load from the vehicle.

661, for an elevator or hoist which includes a carrier, and wherein the carrier includes a loading or unloading means in the nature of a push-pull device for moving a load laterally therefrom or thereto.

679+, for a vehicle having a load receiving portion, and a means for relocating a load of material therealong or therewithin.

510 Three dimensional load-receiving portion includes movable load-underlying surface, and element comprises upright member attached to surface:

This subclass is indented under subclass 509. Apparatus wherein the load receiving portion has a significant depth dimension (e.g., by virtue of the provision of sidewall structure) and includes a movable floor upon which a load is supported, and wherein the load-engaging element is a member which is attached to the floor in an upright position and moves therewith.

(1) Note. While the movable floor may constitute the primary means for ejecting the load, the upright member assists therein by removing any portion of the load which adheres to, or has its outbound movement interfered with, by the sidewall structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

527, for a vehicle of the kind for this area having a flexible conveyor (e.g., a flexible platform) movable across a load bed of the vehicle, which conveyor is used in loading or unloading the vehicle.

511 Pusher moved by ram movable to different positions along load-supporting platform:
This subclass is indented under subclass 509. Apparatus including a reciprocating ram which moves a load-pushing follower along said support means, and means for shifting said ram and follower to different positions on the support means.

512 Plural pushers on same vehicles:
This subclass is indented under subclass 509. Apparatus including two or more load-pushing followers movable along said support means.

513 Pusher guide means:
This subclass is indented under subclass 509. Apparatus including special means, such as tracks cooperating with rollers, for guiding a load-pushing follower along said support means.

514 Pusher moved by flexible means:
This subclass is indented under subclass 509. Apparatus including a rope, cable, chain, or other flexible means connected to a load-pushing follower for moving the latter along said support means.

515 Connected to winch:
This subclass is indented under subclass 514. Apparatus wherein said flexible means is connected to a winding means such as a rotatable drum.

516 Connected to ram actuated by fluid pressure:
This subclass is indented under subclass 514. Apparatus wherein said flexible means is connected to the piston of a ram operated by fluid pressure, movement of said piston pulling said flexible means and said follower connected thereto.

517 Pusher moved by ram actuated by fluid pressure:
This subclass is indented under subclass 509. Apparatus wherein the piston of a ram operated by fluid pressure is connected to a load-pushing follower, movement of said piston pulling or pushing the follower along said support means.

518 Power-driven with cooperating handling means:
This subclass is indented under subclass 507. Vehicles having a power-driven conveyor and another material-handling means mounted on the vehicle, and so related to the material carrying portion of the vehicle as to coact with the conveyor to facilitate loading or unloading of the vehicle.

(1) Note. By "power-driven conveyor" is meant that type of conveyor which is normally classified in Class 198.

(2) Note. Self-loading or unloading vehicles provided with (a) means for agitating the material, or (b) means for spreading material with the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
502+, for plural arrangements of conveyors which handle the load successively.
567+, for vertically swinging load supports combined with an endless conveyor.

519 With gate means:
This subclass is indented under subclass 507. Vehicles having movable gate means for controlling the charging or discharging of material by the conveyor to or from the vehicle.

SEE OR SEARCH CLASS:
296, Land Vehicles: Bodies and Tops, subclasses 50+ for vehicle body end gates.
298, Land Vehicles: Dumping, subclass 7 for gravity unloading vehicles with load-delivering chutes; also, subclass 23 for gravity unloading vehicles having tilting bottoms with cover or endgate control.

520 Multiple gates:
This subclass is indented under subclass 519. Vehicles in which a plurality of gates are provided to control the flow of material to or from the vehicle.

(1) Note. The multiple arrangement normally provides selective discharge of material from the vehicle on to the unloading conveyor.

521 With movable upright plate:
This subclass is indented under subclass 507. Vehicles having an upright plate secured to and movable with the conveyor within the vehicle body to load or unload the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
510, for a self-loading or unloading vehicle having a conveyor for ejecting a load, which conveyor includes an upright member.

522 Laterally movable rigid platform type:
This subclass is indented under subclass 507. Vehicles in which the conveyor comprises a rigid platform type of load support laterally movable to a loading or unloading position.

(1) Note. The movement of the platform may be (a) from a position within the vehicle to a position projecting therefrom, or (b) from one end of the vehicle to the other.

523 Shiftable or removable conveyor unit:
This subclass is indented under subclass 507. Vehicles in which the entire conveyor is shiftably and/or removably attached to the vehicle.

(1) Note. This subclass includes conveyors which may be variably positioned to load and/or unload the vehicle as well as those which may be placed in a storage position on the vehicle when not in use.

SEE OR SEARCH THIS CLASS, SUBCLASS:
503+, for a self-loading or unloading vehicle having a plurality of conveyors for successively handling a load, one of which conveyors is moveably or shiftably mounted.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 312+, 535+, 586+, 631.1+, and 861.1+ for a conveyor of that class which is moveably (e.g., adjustably) mounted.

525.1 Reciprocating type:
This subclass is indented under subclass 507. Vehicle in which the conveyor includes a material engaging member that has a to-and-fro movement and moves the material a distance and then returns either for more material or for another engagement with the same material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
509+, for a self-loading or unloading vehicle having means in the nature of a reciprocably movable, load engaging element for ejecting a load from the vehicle.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 736+ for a pusher conveyor of the reciprocating type, and subclasses 750.1+ for a conveying surface which reciprocates.
226, Advancing Material of Indefinite Length, subclasses 158+ for reciprocating means for advancing material of indefinite length.

525.2 Compactor vehicle including compacting plate:
This subclass is indented under subclass 525.1. Vehicle including, as a component thereof, a container into which the conveyor member is intended to force the conveyed material tightly to eliminate void space.

SEE OR SEARCH THIS CLASS, SUBCLASS:
519+, for a gate member to prevent material from falling out of a container on a vehicle. The compacting plate of this subclass is not a “gate” because it not only prevents material from falling out, but also serves to advance the material into the container.
521, for a movable upright plate within a container on a vehicle.

525.3 Reverse-flow ejection:
This subclass is indented under subclass 525.2. Vehicle of the type wherein material is forced into the container from a first opening and is subsequently ejected through the same opening.

SEE OR SEARCH THIS CLASS, SUBCLASS:

509+, for a self-loading or unloading vehicle having means in the nature of a reciprocably movable, load engaging element for ejecting a load from the vehicle.

525.4 Sequentially acting compacting plates or with closure over compacting plate:

This subclass is indented under subclass 525.3. Vehicle including (a) a first reciprocating conveyor member also for forcing material into the container and a second, subsequently acting conveyor member also for forcing that material into the container, or (b) a reciprocating conveyor member and an openable cover limiting access to the reciprocating conveyor member.

(1) Note. The successively acting conveyor members of clause (1) of this definition are considered to be part of the same conveyor assembly, and not to be "successive handling means".

SEE OR SEARCH THIS CLASS, SUBCLASS:

501+, for a vehicle having successive handling means.

525.5 Compacting plate movable along controlled arc:

This subclass is indented under subclass 525.3. Vehicle wherein the conveyor moves to-and-fro along a prescribed, nonrectilinear path when forcing and conveying material into the container.

(1) Note. Movement of the compacting plate to allow removal of material is not done "when forcing and conveying material into the container" and therefore, does not effect classification herein.

525.51 Including moving compacting plate pivot:

This subclass is indented under subclass 525.5. Vehicle wherein the conveyor member moves about a fixed axis with respect to a movable support, effecting resultant complex movement of the conveyor member.

525.52 Plate pivot moves rectilinearly:

This subclass is indented under subclass 525.51. Vehicle wherein the pivot support moves along a straight-line with respect to the vehicle.

525.53 With pivot-effecting hydraulic cylinder carried on pivot:

This subclass is indented under subclass 525.52. Vehicle including a piston and cylinder adapted to effect pivotal movement of the material engaging member, wherein the piston and cylinder are supported by the movable support.

525.54 Pivot carried by arm turning about fixed second pivot:

This subclass is indented under subclass 525.51. Vehicle wherein the pivot support moves about a fixed axis with respect to the vehicle.

525.55 Sequentially acting compactor plates or with closure over compacting plate:

This subclass is indented under subclass 525.2. Vehicle including (a) a first reciprocating conveyor member for forcing material into the container and a second, subsequently acting conveyor member also for forcing that material into the container, or (b) a reciprocating conveyor member and an openable cover limiting access to the reciprocating conveyor member.

525.6 Rectilinearly reciprocating compacting plate:

This subclass is indented under subclass 525.2. Vehicle wherein the conveyor member moves to-and-fro in a straight-line to force the conveyed material into the container.

525.7 Vibratory:

This subclass is indented under subclass 525.1. Vehicle wherein the conveyor member moves to-and-fro rapidly so as to establish a wave action in the material so as to cause the conveyed material to flow somewhat as a liquid.

525.8 Detachable vibrator:

This subclass is indented under subclass 525.7. Vehicle wherein the conveyor member that moves to-and-fro is readily removable from the vehicle, so that it can be used on another such vehicle.

525.9 Walking beam:
This subclass is indented under subclass 525.1. Vehicle including a first material engaging member that is elongated to bodily support and advance a portion of conveyed material and including a second material that also is elongated to bodily support and advance a portion of conveyed material, wherein the two members are generally parallel and coextensive and function such that one moves to engage and advance the material, then as it pulls away from the material, the other elongated member moves to engage and advance the material wherein the elongated members remain oriented parallel with each other and with the direction of material advance.

(1) Note. The elongated members of this subclass may orbit while facing in a single direction, rather than move to-and-fro along a fixed path.

526 Screw type:
This subclass is indented under subclass 507. Vehicles in which the loading or unloading means is a screw conveyor.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 657+ for a conveyor of the screw type.

527 Flexible conveyor type:
This subclass is indented under subclass 507. Vehicles in which the loading or unloading means comprises a flexible conveyor movable across the bed of a vehicle.

(1) Note. Flexible platforms movable over a vehicle bed which are wound upon or unwound from drums carried by the vehicle are placed here.

SEE OR SEARCH THIS CLASS, SUBCLASS:
510, for a vehicle of the kind of this area having a conveyor for ejecting a load from the load-receiving portion of the vehicle, which conveyor includes a movable, load underlying surface.

528 Endless:
This subclass is indented under subclass 527. Conveyors in which the flexible conveyor is endless.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 804+ for an endless conveyor.
226, Advancing Material of Indeterminate Length, subclasses 170+ for endless-belt-type feeders for material of indefinite length.

529 Load-engaging roller or rollerway:
This subclass is indented under subclass 507. Apparatus wherein a load is guided or supported by at least one roller.

(1) Note. Included here are cylindrical and spherical rollers.

530 With means for locking roller against rotation:
This subclass is indented under subclass 529. Apparatus including means for preventing rotation of a roller.

531 With separate means movable vertically between load supporting and retracted positions:
This subclass is indented under subclass 529. Apparatus including separate means which can be either (a) raised into engagement with a load resting on said roller to lift the load off the roller or to stabilize the load without removing it from the roller, or (b) lowered out of engagement with the load so that the latter is supported only by the roller.

532 Shiftably or removably supported on vehicle:
This subclass is indented under subclass 529. Apparatus wherein said roller can be moved relative to, or is readily mountable on and removable from, a vehicle.

533 Roller connected to support pivotally mounted on vehicle base:
This subclass is indented under subclass 532. Apparatus wherein a roller or plurality of rollers are attached to a support which pivots relative to the main frame or other base member of a vehicle.

(1) Note. This subclass does not include a roller or plurality of rollers carried by a trailer support frame which turns about the wheel axle of the trailer, unless the roller or rollers are connected to a separate support that pivots relative to said trailer support frame.

(2) Note. Included here is a roller mounted on a shaft having eccentric trunnions at its ends, the shaft thus being swingable relative to bearings in which the trunnions are supported.

534 Support pivotal about horizontal axis:
This subclass is indented under subclass 533. Apparatus wherein said support pivots about a horizontal axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:
469+, for a self-loading or unloading vehicle having a load handling means in the nature of a load-receiving portion which is pivotable relative to the horizontal.

535 Vertically shiftable:
This subclass is indented under subclass 532. Apparatus wherein said roller can be raised and lowered.

536 With means for preventing movement of load relative thereto:
This subclass is indented under subclass 529. Apparatus including means which keeps a load from moving after it has been placed on said roller.

537 Skidway:
This subclass is indented under subclass 507. Vehicles having inclined load-engaging ways of skids, for loading or unloading purposes.

(1) Note. The skidway may or may not be permanently attached.

SEE OR SEARCH THIS CLASS, SUBCLASS:
430, for wheel transporting trucks having ramps.
480, for a self-loading or unloading vehicle having a load receiving portion which is pivotable relative to the horizontal, and wherein the portion includes means which extends longitudinally therefrom to form a ramp.
571, for similar devices of general application.

538 With haulage means (e.g., cable, etc.):
This subclass is indented under subclass 537. Devices having means for propelling a load over the inclined way or skid.

SEE OR SEARCH THIS CLASS, SUBCLASS:
494, for a self-loading or unloading vehicle having a load receiving portion which is pivotable relative to the horizontal, and having also a drive means in the nature of a haulage cable for moving a load relative to the portion.
539+, for elevators of the inclined type for loading a vehicle in which the skid or way provides a guide means for the elevating load carrier.
571, for combinations of skidways and hoist ropes not adapted for loading a vehicle.

SEE OR SEARCH CLASS:
254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 279+ and 325+ for apparatus for hauling or hoisting a load; the apparatus is mounted on a vehicle and includes a rotatably driven drum which pulls on a cable attached to the load.

539 Loading or unloading by other carrier or mover means and the load movement thereof:
This subclass is indented under subclass 467. Apparatus wherein the load handling means comprises a carrier or mover of a kind not provided for above, and wherein the movement imparted to a load or a load holder by such a carrier or mover is utilized as a basis for subdividing the art.

(1) Note. The art of this and the indented subclasses came, for the most part, from subclasses 75, 77 through 80, 82, and 85.5 of former Class 214. While most of those subclasses were superior to sub-

classes 506+ (former subclasses 83+), it appears advisable to move this area (539+) below that one until the art of that area (506+) can be reviewed.

(2) Note. Inasmuch as the previously existing breakdown of the art of this area by the type of loading or unloading device (e.g., elevator, vertically swinging load support, etc.) did not appear to avoid the scattering of structurally related devices, it is considered that a more meaningful breakdown of the art may be achieved by giving primary consideration to the path of movement of the load or load holder.

(3) Note. The movements referred to in this and the indented subclasses are those which are performed for an operational purpose, except where the contrary (e.g., for the purpose of storing the load holder) is indicated.

(4) Note. Inasmuch as a carrier having track-guided wheels is not considered to be a conveyor-type carrier, it is placed in this and the indented subclasses rather than in subclasses 506+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

486+, and 491+, for a vehicle having a load receiving portion which is pivotable relative to the horizontal and wherein, in the former subclass, the vehicle includes means to raise a load above the portion for deposit thereon or therein, and, in the latter subclass, the vehicle includes driven means to move a load relative to the portion.

540 Raising or lowering of load or load holder includes vertical, rectilinear movement:

This subclass is indented under subclass 539. Apparatus wherein the carrier or mover raises or lowers a load or load holder in a path which includes movement along a straight-line which is disclosed as being vertical.

SEE OR SEARCH THIS CLASS, SUBCLASS:

357, for a load transporter having a load-handling (i.e., loading or unloading) means in the nature of an elevator, which means operates in response to movement of the transporter.

592+, for a load carrier in the nature of an elevator or hoist.

SEE OR SEARCH CLASS:

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 279+ and 325+ for apparatus for hauling or hoisting a load including a rotatably driven drum which pulls on a cable attached to the load and which is mounted on a vehicle.

541 And carrier or mover includes means enabling additional movement having horizontal component:

This subclass is indented under subclass 540. Apparatus wherein the carrier or mover is provided with means to also permit movement in a direction which is at least in part horizontal to be imparted to the load or load holder.

(1) Note. The means of this subclass has been given an `enabling' context in order not to exclude a significant volume of art wherein the force to cause the movement is a manual one.

(2) Note. The raising of a receptacle in a rectilinear manner, followed by the moving of it horizontally, or with a horizontal component, and the tipping of it to dump its contents, appears occasionally in the art of this subclass.

542 Hoist having traversing (i.e., horizontal) movement:

This subclass is indented under subclass 541. Apparatus wherein the carrier or mover comprises a reelable (or otherwise retractable) cable type lifting device which is mounted, or constructed, in such a manner that it can impart movement in a horizontal direction, either by moving linearly or by pivoting about a vertical axis, to the load.

543 Having boom pivotable about a vertical axis:

This subclass is indented under subclass 542. Apparatus wherein the device comprises or includes a laterally extending, cable-carrying member, which member is rotatable about a vertical axis.

544 Elevator with laterally shiftable guides:
This subclass is indented under subclass 541. Apparatus wherein the carrier or mover is a load-underlying member in the nature of a platform which has guided, generally vertical movement, and wherein means is provided to enable the guide structure to move in a linear, generally horizontal direction.

545 Carrier comprises movable component of load-receiving portion (e.g., tailgate, section of floor, etc.):
This subclass is indented under subclass 540. Apparatus wherein the carrier comprises an element or segment of the load-receiving portion of the vehicle, which element or segment is movable relative to the remainder of the portion.

SEE OR SEARCH THIS CLASS, SUBCLASS:
539, for a movable component of the kind found in this subclass, but wherein the movement thereof, while rectilinear in nature, is not limited to that along a vertical line.

546 Raising or lowering of load or load holder includes curvilinear movement:
This subclass is indented under subclass 539. Apparatus wherein the carrier or mover raises or lowers a load or load holder in a path which includes movement along a line which represents an arc of either fixed or varying curvature.

SEE OR SEARCH THIS CLASS, SUBCLASS:
442+, for a load transporter having a load-handling (i.e., loading or unloading) means in the nature of a vertically swinging member, which means operates in response to movement of the transporter.
680+, for a load mover in the nature of a load-carrying member having means to swing it in a vertical plane.

547 Pivotable, telescopic arm imparts path of plural radii:
This subclass is indented under subclass 546. Apparatus wherein the carrier or mover is an arm (e.g., a boom) which is swingable about a generally horizontal axis and which changes its length by collapsing or extending within itself as it raises or lowers a load or load holder, thus imparting thereto a path which has a plurality (or an infinite number) of radii.

548 Unloader actuated by gravity-influenced load:
This subclass is indented under subclass 546. Apparatus wherein the carrier or mover receives a load at a first elevation and is caused, by the weight of the load, to descend with the load to a second elevation.

549 Carrier or mover includes means enabling additional movement of a rectilinear nature in a direction other than vertical:
This subclass is indented under subclass 546. Apparatus wherein the carrier or mover is provided with means to also permit straight-line movement in a nonvertical direction to be imparted to the load or load holder.

(1) Note. (1) Note of subclass 541 applies similarly here.

SEE OR SEARCH THIS CLASS, SUBCLASS:
551+, for related structure wherein a generally horizontal, rectilinear component is added to the movement of the load or load holder by movement of the vehicle, but not, however, that this is not movement of the load or load holder relative to the load-receiving portion.

550 Carrier or mover includes means enabling additional movement about a vertical axis:
This subclass is indented under subclass 546. Apparatus wherein the carrier or mover is provided with means to also permit rotational movement about a vertical axis to be imparted to the load or load holder.

(1) Note. (1) Note of subclass 541 applies similarly here.

551 Load holder located relative to vehicle in such manner as to accrue load during travel of vehicle:
This subclass is indented under subclass 546. Apparatus wherein the load holder is so positioned with respect to the vehicle and its direc-

tion of movement that it obtains a load (e.g., of earth, cut grain, baled straw, etc.) as a result of the movement of the vehicle (e.g., by being driven beneath or into the load).

SEE OR SEARCH THIS CLASS, SUBCLASS:

442+, is explained in the reference thereto in subclass 546.

546, for related structure, but wherein the load is placed on the load holder while the vehicle is stationary.

552 Carrier or mover pivots about axis parallel to longitudinal axis of vehicle:

This subclass is indented under subclass 551. Apparatus wherein the arc through which the carrier or mover raises or lowers the load holder has its center on a line which is parallel to the longitudinal axis of the vehicle.

553 Load holder or portion thereof has additional axis or pivot relative to swinging arm-type carrier or mover:

This subclass is indented under subclass 551. Apparatus wherein the carrier or mover is in the form of a swinging arm, and the load holder, or a part (e.g., a door) thereof, is pivotable relative to that member as well as to the support about which the member swings.

SEE OR SEARCH THIS CLASS, SUBCLASS:

552, for a carrier or mover which pivots about an axis which is parallel to the longitudinal axis of the vehicle and wherein a load holder thereon frequently is additionally pivotable relative thereto.

554 Load holder pivotable about lower edge of opening in end of load-receiving portion:

This subclass is indented under subclass 551. Apparatus wherein the load holder, which serves also as the carrier, is pivotably mounted along the bottom side of an aperture formed in an end of the load receiving portion, the load holder frequently serving-- after it has been raised to cause its load to move into the receiving portion--to close the aperture therein.

555 With means to grasp load:

This subclass is indented under subclass 546. Apparatus wherein the load holder comprises two or more members which are movable toward one another to grip or otherwise hold therebetween the load.

556 Carrier comprises movable component of load-receiving portion:

This subclass is indented under subclass 546. Apparatus wherein the carrier comprises an element or segment of the load-receiving portion of the vehicle, which element or segment is movable relative to the remainder of the portion.

SEE OR SEARCH THIS CLASS, SUBCLASS:

469, for a self-loading or unloading vehicle having a load receiving portion, or a significant section of the portion, which is pivotable relative to the horizontal. In the instance where only a section of the portion is pivotable, and the movement of that section places a load on, or removes a load from, the vehicle, there may exist considerable similarity with some of the art of this subclass (556), the difference amounting primarily to what proportion of the load receiving portion is represented by the movable significant section of that subclass or by the movable component of this subclass.

546, for related structure, but wherein the carrier is in the nature of an attachment to the vehicle, rather than a component of the load-receiving portion.

557 Tailgate:

This subclass is indented under subclass 556. Apparatus wherein the element is a generally planar surface which in its nonload-moving position forms the rear wall of the load-receiving portion or a significant part thereof.

558 Carrier movable to storage position beneath vehicle:

This subclass is indented under subclass 546. Apparatus wherein the carrier is supported in such a manner that it may be pivoted or otherwise moved to a nonoperating (i.e., storage) position in which it is located beneath the load-

receiving portion or other portion of the vehicle.

559 Loading by haulage cable imparting principally horizontal movement to load or load holder:

This subclass is indented under subclass 539. Apparatus wherein the mover is a reelable (or otherwise retractable) cable which imparts to the load or load holder movement which is principally in a horizontal direction in order to pull the load or load holder to the load receiving portion.

SEE OR SEARCH THIS CLASS, SUBCLASS:

538, for a self-loading or unloading vehicle having a conveyor type loader comprising an inclined way and a means for moving a load thereover, which means may be a cable.

539, for a self-loading or unloading vehicle having a carrier or mover for loading or unloading which may involve a cable, but wherein a principal portion of the movement of the load or load holder is in a lifting (i.e., nonhorizontal) direction.

540, for a self-loading or unloading vehicle having a carrier or mover of the kind noted above for subclass 539, but wherein at least part of the lifting movement is rectilinear in nature and vertical in direction.

SEE OR SEARCH CLASS:

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 279+ and 325+ for apparatus for hauling or hoisting a load; the apparatus is mounted on a vehicle and includes a rotatably driven drum which pulls on a cable attached to a load.

560 TRAVERSING HOIST TYPE:

This subclass is indented under the class definition. Apparatus of the type defined in Class 212, Traversing Hoists, with the addition of some element or qualifying characteristic, as for example, the addition of a chute, making a combination beyond the scope of the hoist class or other classes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

564, for a nontraversing hoist or elevator in combination with an endless or rotary carrier adapted to receive the load from the hoist or elevator.

SEE OR SEARCH CLASS:

212, Traversing Hoists, appropriate subclasses.

561 Traveling crane:

This subclass is indented under subclass 560. Apparatus comprising a Class 212, Traversing Hoists, type traveling bridge means, a trolley thereon and a hoist on the trolley combined with a means whereby the resulting combination is beyond the scope of Class 212.

SEE OR SEARCH CLASS:

212, Traversing Hoists, subclasses 312+ for traveling bridges, per se.

562 Switch system:

This subclass is indented under subclass 561. Apparatus in which the traveling bridge may be switched between rails upon which it is adapted to move.

563 Tow truck type:

This subclass is indented under subclass 560. Apparatus wherein the hoist is supported on and caused to traverse by a land vehicle and adapted to be used to lift or pull a load removed from the vehicle.

564 HOIST OR ELEVATOR AND ENDLESS OR ROTARY CARRIER:

This subclass is indented under the class definition. Apparatus having a hoist or elevator in combination with an endless or rotary carrier arranged so that the load may be discharged from one to the other.

SEE OR SEARCH THIS CLASS, SUBCLASS:

137.1+, for such combinations used to load or unload ships.

565 VERTICALLY SWINGING SHOVEL AND AUXILIARY CARRIER:
This subclass is indented under the class definition. Apparatus having a vertically swingable shovel or scoop combined with an auxiliary carrier whereby load may be delivered from the shovel or scoop to the auxiliary carrier.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 506+ for means for collecting a load from a static support for delivery to an endless conveyor.

566 Vertically swinging shovel having an orbital path:
This subclass is indented under subclass 565. Apparatus in which the shovel or scoop may move in a circuit.

567 VERTICALLY SWINGING LOAD SUPPORT AND ENDLESS OR ROTARY CARRIER:
This subclass is indented under the class definition. Apparatus having combined (a) a load-carrying device which is swingable in a vertical plane, and (b) a load-carrying means of the rotary or endless type.

568 For handling bottles:
This subclass is indented under subclass 567. Apparatus in which said load-carrying means are particularly constructed to accommodate bottle-like articles as a load.

569 VERTICALLY SWINGING LOAD SUPPORT AND HOIST OR DRAG LINE:
This subclass is indented under the class definition. Apparatus having a vertically swinging load support member combined with a hoisting or handling cable which may run over said member, whereby said cable is usable to drag or hoist a load to said member whereupon the member may swing the load in a vertical plane.

SEE OR SEARCH CLASS:
114, Ships, subclasses 373+ for similar devices intended for raising and lowering boats.
212, Traversing Hoists, subclass 169 for traversing hoists which function in a similar manner.
362, Illumination, subclasses 285+ and 319+ for similar devices particularly designed for shifting lamps.

570 ENDLESS OR ROTARY CARRIER AND DRAG LINE SCOOP:
This subclass is indented under the class definition. Apparatus comprising the combination of a scoop means adapted to be loaded by being dragged by a cable means in contact with the material it is to handle and an endless or rotary conveyor to which said material may be delivered by said scoop means.

571 SKIDWAY WITH HOISTING ROPE:
This subclass is indented under the class definition. Apparatus comprising a guideway, either vertical or inclined, and a hoisting rope so arranged as to raise or advance material along the way.

SEE OR SEARCH THIS CLASS, SUBCLASS:
538, for a self-loading or unloading vehicle having an inclined way or skid and a means (e.g., a haulage cable) to move a load over the way or skid.

572 LOAD-TRANSPORTING TYPE VEHICLE TO BE LOADED OR UNLOADED, OR EXTERNAL MEANS FOR THE LOADING OR UNLOADING, OR FOR COOPERATING THEREWITH, OF SUCH A VEHICLE:
This subclass is indented under the class definition. Apparatus comprising either (a) a vehicle of a type used for transporting a load and particularly adapted to cooperate with a disclosed means external thereto for loading or unloading the vehicle, or (b) a means which is external of a disclosed vehicle and is particularly adapted to load, unload, or cooperate in the loading or unloading of (e.g., the means may comprise no more than a static structure which serves only to support the load before, after, or during the loading or unloading) the vehicle; provided that neither vehicle (a) nor means (b) is classifiable elsewhere.

(1) Note. The art of this and the indented subclasses comprises patents from subclasses 38+ of former Class 214, but wherein the claims were found to be limited to either the vehicle or the external

means. Accordingly, although it was not readily establishable at the time of this reclassification, it is possible that a more appropriate locus exists elsewhere for certain of the patents presently classified herein.

(2) Note. Cross-reference copies of the patents of this and the indented subclasses are found in the corresponding combination area, subclasses 333 to 402, when their subject matter sets forth part of a combination expressly provided for in that area (333-402).

SEE OR SEARCH THIS CLASS, SUBCLASS:

333, and 402, for the use, in combination, of the two types of subject matter provided for, per se, in this (572) and the indented subclasses.

467+, for a vehicle having means thereon for loading or unloading itself.

573 Means includes driven carrier for receiving a load from a vehicle at an unloading station:

This subclass is indented under subclass 572. Apparatus wherein the external means includes a carrier of a driven type for handling a load which is to be removed from a vehicle of a load-transporting type at a station.

574 Endless apron-type conveyor:

This subclass is indented under subclass 573. Apparatus wherein the carrier comprises a powered conveyor of the kind having an endless, load underlying surface for moving a load.

575 Means comprises device for changing the attitude of a vehicle, or its load body, relative to the horizontal for unloading by gravity:

This subclass is indented under subclass 572. Apparatus wherein the external means is a device for tilting, inverting, etc., a vehicle which is to be unloaded, or a load-holding component thereof which is to be emptied, in relation to the horizontal in order to cause a load carried thereby, or therein, to depart under the influence of gravity.

576 Framework for holding a vehicle, pivotable about fixed axis through framework parallel to longitudinal axis of vehicle:

This subclass is indented under subclass 575. Apparatus wherein the device comprises a cage-like structure which extends around, or partly around, a vehicle supported therein, which structure is pivotable about an axis which is fixed and extends therethrough in a direction which is parallel to the longitudinal axis of the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

359+, for the combination of the framework of this subclass and a wheeled vehicle held therein.

577 Pivotably movable structure for supporting a vehicle in toto, positioned, at least initially, in underlying relation thereto:

This subclass is indented under subclass 575. Apparatus wherein the device comprises a member (e.g., platform) for supporting a vehicle, which member is mounted for movement about an axis, and wherein the member, at least at the time when the vehicle moves thereonto, occupies a position whereby it is supporting the vehicle from beneath.

SEE OR SEARCH THIS CLASS, SUBCLASS:

362+, for the combination of the member of this subclass and a wheeled vehicle supported thereby.

578 With means for adapting structure to accommodate more than one length of vehicle:

This subclass is indented under subclass 557. Apparatus wherein the structure is provided with means whereby it is adjustable or is otherwise enabled to receive and support, one at a time, vehicles of differing lengths.

(1) Note. The means often comprises an auxiliary platform which is joined to the principal platform to extend it.

579 With fluid or mechanical friction brake to regulate movement of structure:
This subclass is indented under subclass 577. Apparatus wherein the structure is provided with a brake of either a fluid type or a mechanical friction type for smoothing, slowing, or checking its pivotable movement.

(1) Note. In the event that the movement is induced by gravity, the brake is responsible also for starting the movement.

(2) Note. The checking may be of a repetitive nature (e.g., to induce a load to move from the vehicle).

580 With means for limiting longitudinal movement of vehicle on structure:
This subclass is indented under subclass 577. Apparatus wherein the structure is provided with means (e.g., a stop) for reducing or eliminating movement, in a direction parallel to its longitudinal axis, of a vehicle supported thereon.

581 Having axis of pivot parallel to longitudinal axis of vehicle:
This subclass is indented under subclass 577. Apparatus wherein the axis of pivot of the member is parallel to the longitudinal axis of a vehicle supported thereon.

582 By raising one end of a vehicle relative to other end thereof:
This subclass is indented under subclass 575. Apparatus wherein the device (e.g., an elevator, hoist, jack, swinging arm, etc.) acts on one end of a vehicle to push, pull, or otherwise move it to a height which is superior to that of the other end of the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
385, for the combination of a driven device for raising one end of a wheeled vehicle relative to the other end, and the vehicle.

583 Including a vertically swinging lifting member:
This subclass is indented under subclass 582. Apparatus wherein the device includes a member which supports a portion of a vehicle adjacent to an end thereof and is driven about a horizontal axis of pivot to raise that end of the vehicle.

584 Means comprises device or member for moving or causing movement of either a vehicle or load receiving or relinquishing structure for an alignment purpose:
This subclass is indented under subclass 572. Apparatus wherein the external means comprises a device or a member which changes, or results in changing, either the position of a vehicle which is to be loaded or unloaded relative to a structure which is to give up or receive the load of such a vehicle, or the position of such a structure relative to such a vehicle, the change in position being for the purpose of placing the vehicle and the structure in a directional relationship with each other which will aid the transfer of a load therebetween.

SEE OR SEARCH THIS CLASS, SUBCLASS:
396, and 401, for the combination of a wheeled vehicle and an external means in the nature of either a load support, or a load receiving or relinquishing structure, respectively, and wherein is provided means for aligning the vehicle and the external means.

585 Means includes a load-engaging surface or element for pushing load from vehicle:
This subclass is indented under subclass 572. Apparatus wherein the external means includes a surface or element for engaging the side of a load on a vehicle and causing the load to be pushed from the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
395+, and 400, for the combination of a wheeled vehicle and external means in the nature of a pushing or pulling device for either unloading, or loading, respectively, the vehicle.

586 DEVICE OR ELEMENT ASSOCIATED WITH THE HANDLING OR MOVING OF

A CHARGE FOR A HEATING-TYPE CHAMBER:
This subclass is indented under the class definition. Apparatus comprising (a) a device or element for handling a material charge within a receptacle-like structure of the kind adapted to be provided with means for heating it, or (b) a portion of a device for moving a material charge to or from a receptacle-like structure of the kind adapted to be provided with means for heating it.

SEE OR SEARCH CLASS:
202, Distillation: Apparatus, subclasses 239+ for an element used in connection with a still, retort, or the like (e.g., a coke oven), and subclasses 242+ for such an element if it is in the nature of a closure.

587 Charge leveler:
This subclass is indented under subclass 586. Apparatus wherein the device comprises means for leveling the upper portion of the material charge after it has been deposited in the chamber.

588 Of rotary type:
This subclass is indented under subclass 587. Apparatus wherein the leveling means is mounted for rotating about an axis.

589 LOAD SUPPORT HAS LINEAR VERTICAL MOVEMENT AND ADDITIONAL MOVEMENT FOR ALIGNING AND MOUNTING LOAD AT A SPECIFIC LOCATION:
This subclass is indented under the class definition. Apparatus having means constructed to move an article linearly in a vertical direction and means for moving said article additionally in other directions or into different attitudes for the purpose of establishing a specific positional relationship between the article and a means to which it is to be attached.

(1) Note. A mere platform (e.g., forks of a fork lift truck) or bed means upon which any article may be placed are not included under the definition. See, for example, subclasses 427+ for shovel or fork type vertically swinging load supports.

(2) Note. Article position changing manipulators include any movement transmission means which, when activated by manual or other means, causes the article to move and change position. A swivel mounted article support, per se, permitting the position of the article to be changed as a result of manual engagement with the article, is, for example, in subclasses 754+ below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
540+, for a self-loading or unloading vehicle having a load handling means which raises or lowers a load in a path which includes vertical, rectilinear movement.

SEE OR SEARCH CLASS:
105, Railway Rolling Stock, subclass 177 for rail mounted manipulators.
254, Implements or Apparatus for Applying Pushing or Pulling Force, appropriate subclasses for means to pull an article in a vertical direction.
269, Work Holders, appropriate subclasses for adjustable work holders.

590 Additional movement is rotational:
This subclass is indented under subclass 589. Apparatus in which the other movement imparted to the article is swinging, rotary, or curvilinear.

591 GUIDED HOIST WITH LOAD-SUPPORTING GRAB MEANS MOVABLE HORIZONTALLY BY MEANS WHICH SWINGS HORIZONTALLY OR MOVES LINEARLY:
This subclass is indented under the class definition. Apparatus having a grab actuatable to engage a load to move the load between horizontally spaced positions by being moved in a vertical direction by a hoisting means which, when actuated, restricts lateral movement of said grab, and having means for conveying said hoisting means either linearly or in a horizontally swinging motion transversely of its vertical motion.

(1) Note. The conveying means does not include a ground engaging vehicular support for the hoisting means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

564, for a hoist or elevator which may deposit its load on a rotary or endless carrier.

589+, for load supports which are capable of vertical linear movement and have an additional movement capability for the purpose of positioning a load for the mounting of the same at a specific location.

618+, for grabs hoisted by means having no significant transverse motion capability.

629+, and 631+, for an elevator movable on an adjustably mounted guide and wherein the guide may be mounted on a vehicle.

729+, for a grab supported by a vertically swinging member.

SEE OR SEARCH CLASS:

212, Traversing Hoists, appropriate subclasses for similar device having freely suspended hoist means.

592 ELEVATOR OR HOIST AND LOADING OR UNLOADING MEANS THEREFOR:

This subclass is indented under the class definition. Apparatus comprising a ground-, structure-, vehicle-, or otherwise-supported elevator or hoist for raising or lowering a load, the load being raised, etc., on a load carrier (or, as sometimes identified herein, a carrier) in the form of a bucket, cage, car, grapple, hook, lifting fork, platform, etc., which load carrier moves in a vertical or inclined path, and a means for loading or unloading the carrier or for facilitating the loading or unloading thereof.

(1) Note. A significant difference between an elevator and a hoist is that the former includes structure for guiding its load carrier.

(2) Note. This subclass and subclass 95 of former Class 214, previously included the limitation "self" (as applied to the loading or unloading means) in its title. While a significant portion of the art may meet such a limitation, the art seen in the reclassification of this subclass and those indented subclasses formerly numbered 660 (now 628+), 670-674 (now 630+), 701 (now 640+), and 730, 731 (now 662+), as well as that seen in newly developed subclasses 659+, indicated that the limitation could not be retained.

(3) Note. In the reclassification of the subclasses mentioned in (2) Note, it appeared appropriate, except in the case of subclasses 659+, to distinguish those elevators or hoists which claimed portability (e.g., vehicle-mounted) from those which did not; however, it is pointed out that, (a) the art in the new "portability" subclasses has not been screened against the vehicular areas of the class, and (b) the establishment of the "portability" subclasses does not mean that there are not patents to vehicle-mounted elevators or hoists in other, non-reclassified subclasses which depend from subclass 592.

(4) Note. The line between a material handling device proper for this Class (414) and an elevator or industrial lift truck proper for Class 187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, is as follows: (a) Class 414 provides for load engaging structure in which the load support surface travels in a generally vertical primary lift direction and (1) is mounted for movement in a direction other than the primary lifting direction (e.g., tilting) or (2) has an additional load handling structure (e.g., conveyor) or (3) is constructed in such a manner that the load support surface is inherently self-charged or self-discharged along the primary lift direction; and (b) Class 187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, provides for industrial lift trucks or components thereof when the load is shifted in its entirety in a primary lifting direction from one level to another vertically spaced level and may additionally include (1) mere pivoting or tilting of the load supporting structure for detach-

ment or storage or (2) retaining of a received load on the support surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

143.1, for ship charging or discharging apparatus in the nature of a hoist line bucket.

191, for the charging of a chamber utilized for a heating function by means of a driven device for transporting material to and/or into, or into and within, the chamber and wherein the device comprises a traversing hoist having either a material underlying support or a material attracting and gripping means.

246, 247+, 249+, 260, and 264, for a vertically moving vehicle carrier, which carrier is adapted for charging or discharging a facility for the parking of wheeled vehicles.

281, for a means for charging or discharging plural, static structures, and wherein the means includes a portable elevating device having a load-sustaining surface.

364+, for the combination of a pivotably or tiltably movable structure for supporting a wheeled, load-transporting type vehicle and reorient-the vehicle into a load-releasing attitude, and the vehicle being loaded thereby, and wherein the axis of pivot or tilt of the structure is vertically shiftable (e.g., by means in the nature of an elevator or hoist).

385, for the combination of a device external of a wheeled, load-transporting type vehicle for raising one end of the vehicle to promote movement of a load therefrom by gravity, and the vehicle being unloaded thereby.

391+, for the combination of a driven device external of a wheeled, load-transporting type vehicle for raising or lowering a load which is to be taken from the vehicle, and the vehicle being unloaded thereby.

399, for the combination of a device external of a wheeled, load-transporting type vehicle for raising or lowering a load which is to be moved to the vehicle, and the vehicle being loaded thereby.

422+, for a receptacle emptying device of an elevator type.

427, for a wheel and wheel type article handler and transporter having a wheel engaging means of an elevator type.

441, for a motion responsive load handler and transporter, wherein the handler is operated by a ground-engaging wheel and is guided for rectilinear movement in a vertical or inclined path.

458+, for a vehicle having load handling means in the nature of spaced, shelf-like load engaging portions, which portions engage the load from opposite sides and elevate it for transport.

460+, for a vehicle which straddles a load and elevates it.

471, for a self-loading or unloading vehicle having a load-receiving portion which is pivotable relative to the horizontal and wherein means is provided for also raising or lowering the portion and its axis of pivot.

486+, for a self-loading or unloading vehicle having a load receiving portion which is pivotable relative to the horizontal and wherein the vehicle has means to raise a load above said portion for deposit thereon or therein.

495+, for a self-loading or unloading vehicle having a load-receiving portion which is movable in a vertical or inclined path. While that area (495+) does not exclude a vehicle-mounted elevator (e.g., an industrial truck), the placement of the art (in former Class 214) appears to have evolved in such a manner that a truck of the “roadway” type was considered proper for classification there (495+), whereas a truck of the industrial type was more likely to be classified here (592+) -- in spite of the fact that this area has not, in the past, provided recognition for the vehicular aspect of such a truck.

540+, for a self-loading or unloading vehicle having a load-handling means which raises or lowers a load in a path which includes vertical rectilinear movement.

564, for a combination of carriers, at least one of which is an elevator or hoist

and another is an endless or rotary carrier.

582+, for a device for raising one end of a vehicle relative to the other end thereof in order to place the vehicle in an attitude whereby it will unload under the influence of gravity.

589+, for a load support which moves linearly in a vertical direction and has additional movement for aligning and mounting its load.

814, for a process of charging or discharging an elevator or hoist and loading or unloading means therefor.

SEE OR SEARCH CLASS:

37, Excavating, subclasses 398+ for a scoop or bucket having separate lines to load and hoist.

89, Ordnance, subclass 46 for ordnance hoisting apparatus.

186, Merchandising, subclasses 51 and 22+ for a service type elevator for a dining room or store, respectively.

187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, appropriate subclasses for an industrial lift truck or elevator having load handling means. (See above line note for distinction).

593 Mail:

This subclass is indented under subclass 592. Elevating devices specialized for the handling of mail.

SEE OR SEARCH THIS CLASS, SUBCLASS:

265, for a guided, wheeled device for transporting mail and an external means cooperating therewith for loading or unloading the device.

SEE OR SEARCH CLASS:

198, Conveyor: Power-Driven, subclasses 349.1+ for systems including similar devices.

258, Railway Mail Delivery, for devices which transfer mail to and from moving trains.

594 Load lowering, automatic return:

This subclass is indented under subclass 592. Elevating devices designed to lower a load, discharge or release it, and automatically return the carrier to receiving position.

SEE OR SEARCH CLASS:

186, Merchandising, subclasses 4+ for gravity operated tilting track sections.

595 Inclined track:

This subclass is indented under subclass 592. Elevating devices comprising an inclined track and a load-handling load carrier.

(1) Note. If the device has both inclined and vertical track-sections, it is classified in one of the preceding subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

168+, and 178, for receptacles moved back and forth along an inclined way in combination with a chamber of a type utilized for a heating function.

SEE OR SEARCH CLASS:

104, Railways, subclass 135 for cars traveling on inclined planes.

187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, subclasses 245+ for an inclined elevator which does not include structure or means to load or unload its load supporting structure.

596 Ditching type:

This subclass is indented under subclass 595. Devices adapted for ditching or similar operations, typically comprising a portable and vertically adjustable trackway extending transversely of the ditch and a scoop operating on the trackway whereby the trackway serves as a templet to control the cross section of the ditch or excavation.

597 Pivoted track:

This subclass is indented under subclass 596. Devices wherein the scoop or fork runs on a trackway pivoted for vertical on swinging and usually extending longitudinally of the excavation.

598 Tilting carrier:
This subclass is indented under subclass 595. Devices wherein the carrier has a tilting movement at some portion of its travel for the purpose of loading or unloading.

599 Tilting track section:
This subclass is indented under subclass 598. Elevating handlers in which there is a tilting section pivoted to the inclined trackway, which section receives the carrier and tilts with it.

600 Running out from base:
This subclass is indented under subclass 598. Tilting elevating devices comprising a carrier, usually a fork or scoop, designed to move out from the inclined track at its lower end, ordinarily for the purpose of gathering a load.

SEE OR SEARCH THIS CLASS, SUBCLASS:
605, for similar devices not involving a tilting carrier.

601 Return, buffer, or counterweight feature:
This subclass is indented under subclass 600. Elevating devices comprising some means tending to return the carrier from dumping position, a buffer of some kind, or a counterweight.

602 Return, buffer, or counterweight feature:
This subclass is indented under subclass 598. Tilting carrier devices having some means tending to return the carrier from dumping position, a buffer of some kind, or a counterweight.

603 Skeleton or fork:
This subclass is indented under subclass 598. Tilting elevating devices having a carrier of openwork construction, usually a fork.

604 Outhaul feature:
This subclass is indented under subclass 595. Elevating devices having means to move the carrier out from the track at its lower end.

SEE OR SEARCH CLASS:
37, Excavating, subclasses 394+ for cable operated excavators.

605 Carrier running out from base:
This subclass is indented under subclass 595. Elevating devices comprising a carrier, usually a fork or scoop, designed to move out from the track at its lower end, ordinarily for the purpose of gathering a load.

SEE OR SEARCH THIS CLASS, SUBCLASS:
600+, for similar devices in which the carrier is tilted to load or unload.

606 Magnet and grab:
This subclass is indented under subclass 592. Elevating devices wherein a magnet is arranged to first lift a plate or other object of magnetic material, and thereafter a grapple may seize it.

SEE OR SEARCH THIS CLASS, SUBCLASS:
737, for a vertically swinging load support provided with a load-grasping member which may be in the nature of a magnet.

607 Convertible attachment:
This subclass is indented under subclass 592. Elevating devices comprising an elevating load supporting means and a mechanism readily attachable thereto to convert the load supporting means to a different type of handling mechanism.

(1) Note. The devices here classified are, for the most part, industrial trucks having attachments for converting them into cranes, portable grapples and the like.

608 Separable rack:
This subclass is indented under subclass 592. Elevating devices which comprise a frame or rack for receiving a load when not mounted on the elevator and means on the elevator for engaging or “laying hold” of the frame or rack to handle it.

SEE OR SEARCH THIS CLASS, SUBCLASS:
446, for tilting vehicle type handlers having separable load racks therefor.

498+, for vehicles having means for moving a separable load rack onto the carrying portion of the vehicle.

609 With external cooperating movable feeding or discharging means:
This subclass is indented under subclass 592. Elevator devices having means separate from the carrier positioned adjacent the path of the carrier for receiving the load from the carrier or feeding the load thereto, and which means is movable to or from an operative position with respect to the carrier.

SEE OR SEARCH THIS CLASS, SUBCLASS:
564, for combinations of elevators and endless or rotary carriers.

610 Elevator carrier movement responsive:
This subclass is indented under subclass 609. Movable feeding or receiving means which are operated by movement of the carrier with respect to said means.

611 Vehicle handling:
This subclass is indented under subclass 610. Devices comprising means for moving cars onto or off the carrier.

(1) Note. The load being placed upon or removed from the elevator, in this subclass, is in the form of a wheeled carrier, i.e., a car.

SEE OR SEARCH THIS CLASS, SUBCLASS:
253+, for a facility for the parking of wheeled vehicles, wherein is provided means for moving a vehicle to or from a device which carries the vehicle within the facility, which device may be in the nature of an elevator.

SEE OR SEARCH CLASS:
104, Railways, subclass 128 for elevators for transferring cars to or from a track section which do not include external means for moving or controlling the movement of a car onto the elevator.

612 Loading means:
This subclass is indented under subclass 610. Devices in which the movable means is constructed and arranged to load the carrier.

613 Flow control mechanism (i.e., volume):
This subclass is indented under subclass 612. Loading means in which means are provided for measuring or controlling the flow of a predetermined amount of material into the carrier.

SEE OR SEARCH THIS CLASS, SUBCLASS:
21, for devices of this character in which the control of the amount of material is by weight.

614 Trap chamber type:
This subclass is indented under subclass 613. Flow control devices in the form of a trap chamber adapted to receive a predetermined volume of material and subsequently discharge it into a carrier.

615 Movable to feeding position over carrier:
This subclass is indented under subclass 612. Devices in which the movement of the loading means is into the path of movement of the carrier.

(1) Note. These devices are, for the most part, chutes mounted for movement to a position in which the discharge end thereof is positioned above the carrier.

SEE OR SEARCH THIS CLASS, SUBCLASS:
613+, for similar devices including means for predetermining the quantity of material loaded into the carrier.

616 Valved carrier:
This subclass is indented under subclass 610. Devices in which the carrier includes valve or gate type means for permitting gravity discharge of the load therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:
414, for a receptacle dumping device in which means are provided on the dumping mechanism for controlling

discharge of material from the inverted receptacle.

644, for an elevator or hoist type device having a valved carrier which is tilted to assist in its loading or unloading.

657, for an elevator or hoist type device having a carrier which comprises a valved container.

SEE OR SEARCH CLASS:

166, Wells, subclasses 162+ for valved buckets especially adapted for use in a well.

294, Handling: Hand and Hoist-Line Implements, subclasses 68.22+ for hoist-line buckets, per se, which may or may not be of the valved type.

617 Adjustably mounted discharge guide:

This subclass is indented under subclass 609. Devices including a chute or the like adapted to receive material from the elevator and adjustably mounted for movement along the elevator structure so as to direct materials from various points of elevation.

618 Grab:

This subclass is indented under subclass 592. Apparatus in which the load carrier is a seizing, grasping, or clamping means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

444, for a tiltable or rockable vehicle having a load grasping or hooking means thereon.

606, for the combination of a magnet and grab load elevating means.

729+, for a vertically swinging load support having a load-engaging grab.

SEE OR SEARCH CLASS:

212, Traversing Hoists, pertinent subclasses entitled “grab”, for hoists having a grab suspended from a support by a cable combined with means to swing or shift the grab laterally.

619 Cantilevered type (e.g., industrial truck, etc.):

This subclass is indented under subclass 618. Elevating grab devices in which the load grasping means projects substantially in its entirety from one side of the elevator structure in cantilevered fashion so as to facilitate engagement of a load.

SEE OR SEARCH THIS CLASS, SUBCLASS:

647, and 655, for cantilevered elevator or hoist devices in which the load support is not in the form of a grab means.

620 Movable about horizontal axis:

This subclass is indented under subclass 619. Devices in which the grab is mounted for swinging or rotating movement as a unit about a horizontal axis provided by a pivot means located on the elevating support for the grab to shift the load after it is engaged by the grab.

SEE OR SEARCH THIS CLASS, SUBCLASS:

639, for elevators not provided with grab means, which are mounted for swinging movement about horizontal axes.

621 Movable rigid jaw clamping type:

This subclass is indented under subclass 619. Grabs in which the article engaging means comprises swingable of slidable rigid jaw means adapted to grasp an article for subsequent handling.

SEE OR SEARCH THIS CLASS, SUBCLASS:

592, having a carrier comprising spaced, elongated, horizontally coplanar members, and wherein one or more of the members is shiftable in a horizontal plane in a direction perpendicular to the axis of elongation.

665+, 667, 669+, and 671, for an elevator or hoist of this heading.

SEE OR SEARCH CLASS:

294, Handling: Hand and Hoist-Line Implements, subclasses 103.1+ and 106+ for movable jaw-type hand and hoist line grapples.

622 Horizontal support with coacting element or holddown:

This subclass is indented under subclass 621. Grabs having jaw portions, one of which provides a primary support in the form of a horizontal platform, fork, or the like arranged to

normally pick up or receive a load and support it against gravity, and the other of which is movable relative to said primary support to secure the load on the latter.

SEE OR SEARCH CLASS:
248, Supports, subclasses 362, 499, and 500+ for means to hold an element or article to its supporting surface.
280, Land Vehicles, subclasses 34+ for vehicles having load binders combined therewith.

623 Multiple article or rack type:
This subclass is indented under subclass 621. Jaw type grabs in which the grasping means comprises (a) a plurality of grapples for engaging distinct and separated articles, or (b) a compartmented skeleton framework for receiving an article in each compartment and article grasping means associated with each compartment.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclasses 87.1+ for hand or hoist-type multiple grapples.

624 Clamshell:
This subclass is indented under subclass 618. Grab devices having cooperating jaw portions similar in shape to the two halves of a clamshell which are relatively movable to provide a grapple type of bucket.

SEE OR SEARCH CLASS:
37, Excavating, subclass 340 or 341 for clamshell bucket type dredgers, and subclass 461 for clamshell buckets, per se.
212, Traversing Hoists, all subclasses entitled "grab", for clamshell bucket type of grabs constituting the load engaging portion of various types of traversing hoists.

625 Guided:
This subclass is indented under subclass 624. Clamshell bucket type of grab in which means are provided for restraining the movement of the clamshell to a predetermined path of travel.

626 Suspended:
This subclass is indented under subclass 618. Devices in which the grab means is supported solely from above by its raising and lowering mechanism and is free on all sides for readily engaging the load.

627 Suction gripper type:
This subclass is indented under subclass 618. Apparatus having means to develop an area of reduced pressure between the load carrier and the load thereby adapting the carrier to support the load from movement.

628 Elevator wherein means comprises guide mounted for relative movement, and tiltable carrier thereon:
This subclass is indented under subclass 592. Apparatus comprising an elevator, and wherein the means for loading or unloading the carrier thereof comprises means whereby the structure which guides the carrier in its vertical travel may be moved (e.g., repositioned, adjusted, etc.) relative to its support, and additional means whereby the carrier may tilt (i.e., pivot about an axis which is other than vertical) relative to the guide structure.

629 Portable (e.g., vehicle-mounted, etc.) elevator:
This subclass is indented under subclass 628. Apparatus wherein the guide and carrier are components of an elevator which is supported in such a manner (e.g., as being mounted on a vehicle) that it may be moved readily from one location to another.

(1) Note. See (3) Note of subclass 592.

SEE OR SEARCH CLASS:
187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, subclasses 222+ for a self loading or unloading industrial lift truck having a vertically moving load support which does not have either its load support mounted for movement in an additional direction (e.g., tilting) or an additional means to load or unload the load support (e.g., power roller).

630 Elevator wherein means comprises guide mounted for relative movement:
This subclass is indented under subclass 592. Apparatus comprising an elevator, and wherein the means for loading or unloading carrier thereof comprises means whereby the structure which guides the carrier in its vertical travel may be moved (e.g., repositioned, adjusted, etc.) relative to its supporting structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
628, for subject matter of the kind provided for in this subclass (630) and an additional loading or unloading means in the nature of a provision for pivotable movement of the carrier relative to the guide.

631 Portable (e.g., vehicle-mounted, etc.) elevator:
This subclass is indented under subclass 630. Apparatus wherein the guide is a component of an elevator which is supported in such a manner (e.g., as by being mounted on a vehicle) that it can be moved readily from one location to another.

SEE OR SEARCH THIS CLASS, SUBCLASS:
592, (3) Note

SEE OR SEARCH CLASS:
187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, subclasses 222+ for a self loading or unloading industrial lift truck having a vertically moving load support which does not have either its load support mounted for movement in an additional direction (e.g., tilting) or an additional means to load or unload the load support (e.g., power roller).

632 Having one or more axes of pivotable movement:
This subclass is indented under subclass 631. Apparatus wherein the relative movement of the guide is pivotable in nature and occurs about one or more axes.

633 Including vertical axis:
This subclass is indented under subclass 632. Apparatus wherein part or all of the relative pivotable movement of the guide takes place about a vertical axis.

634 Single axis, horizontal and fixed:
This subclass is indented under subclass 632. Apparatus wherein all of the relative pivotable movement of the guide takes place about a single axis, which axis lies on a horizontal line and is not displaceable therefrom.

(1) Note. The movement about the axis is, therefore, swinging movement in a vertical plane.

635 With fluid drive for movement thereabout:
This subclass is indented under subclass 634. Apparatus wherein an actuating means of a fluid type is provided for moving the guide about the axis.

636 And means for limiting the movement:
This subclass is indented under subclass 635. Apparatus wherein means is provided to limit the movement imparted to the guide by the fluid drive.

(1) Note. The limiting means may act in response to a sensed condition (e.g., the measuring of a movement imposed upon the guide), or it may be merely a stop member (e.g., an abutment).

SEE OR SEARCH CLASS:
212, Traversing Hoists, subclass 280 for a rotary crane which is provided with an automatic stop.

637 Having one or more axes of pivotable movement:
This subclass is indented under subclass 630. Apparatus wherein the relative movement of the guide is pivotable in nature and occurs about one or more axes.

638 Single axis, horizontal and fixed:
This subclass is indented under subclass 637. Apparatus wherein all of the relative pivotable movement of the guide takes place about a single axis, which axis lies on a horizontal line and is not displaceable therefrom.

(1) Note. See (1) Note of subclass 634.

639 Tilting carrier:
This subclass is indented under subclass 592. Elevating devices wherein the load carrier as a whole has a tilting motion in a vertical direction (i.e., about a horizontal axis) at some point in its path of travel, usually for the purpose of loading or unloading.

(1) Note. The inclusion of a load by name only, e.g., car, container, or the like, in the absence of any structure adapting the carrier to such load, does not exclude the device from this and indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:
422+, for a receptacle emptying device of the elevator type.
598+, for an inclined elevator type of handler having a tilting carrier.
620, for an elevating grab in which the grab means is rotatable about a horizontal axis.
628+, for an elevator wherein the loading or unloading means comprises moveably mounted, carrier-guiding structure, and wherein is included means whereby the carrier may pivot (e.g., tilt) relative to the structure.
657+, for an elevating device having a carrier in the form of a receptacle or the like, which carrier includes means for controllably releasing a load.

640 With operator-controlled tilting means:
This subclass is indented under subclass 639. Apparatus comprising means for imparting the tilting motion to the carrier, which means is actuated by an operator whenever it is desired to tilt the carrier.

641 On portable (e.g., vehicle-mounted, etc.) elevator:
This subclass is indented under subclass 640. Apparatus wherein the carrier is a component of an elevator which is supported in such a manner (e.g., as by being mounted on a vehicle) that it may be moved readily from one location to another.

642 Tiltable about axis perpendicular to direction of travel of portable elevator (e.g., forwardly tiltable, etc.):
This subclass is indented under subclass 641. Apparatus wherein the tilting motion of the carrier takes place about an axis which extends at a right angle relative to a line representing the direction of travel of the elevator as it moves from one to another of its location.

643 Sectional platform type:
This subclass is indented under subclass 639. Tilting carriers presenting a table or flat supporting surface having an articulated construction, and in which the sections are hinged for relative movement for purposes of loading or unloading.

(1) Note. The usual type has two leaves hinged at their adjacent edges and swingable downwardly to dump the load between them.

SEE OR SEARCH CLASS:
37, Excavating, subclasses 412+ and 444+ for elevatable scoops involving analogous constructions.

644 Valved:
This subclass is indented under subclass 639. Tilting carriers in the form of a bucket skip box or similar container having movable means thereon for providing an opening or passageway through which the load may discharge by gravity when the carrier is tilted.

SEE OR SEARCH THIS CLASS, SUBCLASS:
616, for valved carriers of the type found here combined with movable material loading or unloading means which is operated by movement of the carrier.
657+, for elevator buckets or skips that discharge solely through a controlled port or outlet.

645 Latch release:
This subclass is indented under subclass 639. Tilting carriers having readily releasable locking or latching means for preventing the carrier from swinging to dumping position relative to its support and means for releasing said means.

(1) Note. Toggle linkage arranged to permit tilting of a carrier are classified in this and the indented subclasses.

646 With carrier engaging cam means:
This subclass is indented under subclass 645. Tilting carriers in which guide or deflector means are provided in or adjacent to the path of movement of the carrier for causing or permitting tilting of the latter when the latch means is released to permit such tilting action.

SEE OR SEARCH THIS CLASS, SUBCLASS:
648, for similar devices in which no latch means is provided for preventing tilting of the carrier.

647 Cantilevered carrier:
This subclass is indented under subclass 645. Tilting carriers in which substantially the entire load carrying portion of the carrier, as well as the pivot mounting therefor, is positioned to one and the same side of the upright guides of the elevator or hoist mechanism.

648 Camming trackway:
This subclass is indented under subclass 639. Tilting carriers in which guide means are provided in or adjacent to the path of movement of the carrier, for causing or permitting tilting of the latter, and along which the latter moves as it is guided into a tilting position.

(1) Note. The tilted position assumed by the carrier may be for the purpose of dumping a load or receiving a load.

(2) Note. Cooperating rack and pinion arrangements on the carrier and guideway are placed here.

SEE OR SEARCH THIS CLASS, SUBCLASS:
646, for similar devices combined with latch means for controlling tilting movement of the carrier.

649 Adjustable:
This subclass is indented under subclass 648. Devices in which the carrier guiding or tilting means is adjustable to permit varying of the point of discharge.

(1) Note. These devices will permit selecting the lateral direction of discharge as well as the elevation.

650 Yoke suspended carrier:
This subclass is indented under subclass 648. Devices in which the carrier is pivotally suspended within a yoke type elevating support to permit pivoting thereof by the tilting means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
649, for yoke supported carriers having adjustable cam means for tilting the carrier.

651 Tethered type:
This subclass is indented under subclass 639. Devices in which an elongated member of predetermined length is secured at one end to the elevatable swingably mounted carrier and anchored at its other end to a relatively fixed support.

652 Abutment or limit stop:
This subclass is indented under subclass 639. Tilting carriers comprising means positioned in the path of travel of the carrier, and engageable therewith, to cause it to tilt as it is moved relative to said means.

653 Swinging:
This subclass is indented under subclass 652. Devices in which the carrier tilting means is moveably mounted to permit joint movement of the carrier and its tilting means in a lateral direction to the elevating path of travel of the carrier to facilitate loading or unloading of the latter.

654 Engageable upon reversal or lowering of carrier:
This subclass is indented under subclass 652. Devices in which the tilting means is in the form of an elevated support past which the carrier moves in its ascent and with which it engages upon descent, its position and construction being such as to cause tilting of the carrier as it is lowered while in engagement therewith.

SEE OR SEARCH THIS CLASS, SUBCLASS:

424, for similar arrangements for dumping portable receptacles.

655 Cantilevered carrier:

This subclass is indented under subclass 654. Devices in which substantially the entire load carrying portion of the carrier, as well as the pivot mounting therefor, is positioned to one and the same side of the upright guides of the elevator or hoist mechanism.

SEE OR SEARCH THIS CLASS, SUBCLASS:

647, for a cantilevered, tilting carrier having a readily releasable latching means for controlling its pivotable movement.

656 Carrier and guide supported cooperating elements:

This subclass is indented under subclass 652. Devices in which means is provided on the carrier for cooperative engagement with means positioned on the elevator guide structure for causing tilting of the carrier.

(1) Note. The means on the carrier and the guide structure are supplemental to both the carrier and guide structure.

657 Valved:

This subclass is indented under subclass 592. Devices comprising an elevator in the form of a bucket, skip, box, or similar container having movable means thereon for providing an opening or passageway through which the load may discharge by gravity.

SEE OR SEARCH THIS CLASS, SUBCLASS:

616, for similar devices combined with movable external loading or unloading means.

644, for a tiltable carrier having a controllable discharge.

SEE OR SEARCH CLASS:

166, Wells, subclass 69 for well heads combined with a receptacle for insertion into the well, and subclasses 162+ and subclasses there noted for valved well receptacles.

294, Handling: Hand and Hoist-Line Implements, subclasses 68.22+ for hoist-line buckets including valved type.

658 Cam or abutment operated:

This subclass is indented under subclass 657. Elevating receptacles which include cam means or stationary abutment means in the path of movement of the receptacle to render the valve means effective.

659 Comprising device on carrier to move or carry load laterally thereto or therefrom:

This subclass is indented under subclass 592. Apparatus wherein the loading or unloading means comprises at least one device (e.g., ejector, conveyor, swinging arm, etc.) located on the carrier, which device pushes, pulls, transports, etc., a load to or from the carrier in a direction generally at right angles to the primary path of travel thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

253+, for a wheeled vehicle parking facility having a site for accommodating a vehicle and a carrier for moving the vehicle thereto or therefrom, and wherein the carrier or site is provided with means to move the vehicle from one to the other.

277+, for means for charging or discharging a plurality of static, load underlying members, which means includes a load-sustaining surface and a device to move the load in a direction which includes a horizontal component.

281+, for means for charging or discharging a plurality of static, load underlying members, which means comprises an elevating device movable in a horizontal direction (e.g., portable), and which has a load-sustaining surface.

497, for a self-loading or unloading vehicle having an elevatable load body, and wherein is provided a load handling means in the nature of a reciprocating conveyor.

660 Device raises load relative to carrier prior to moving it laterally:

This subclass is indented under subclass 659. Apparatus wherein the device includes means for moving the load upwardly, relative to the carrier, before moving it to or from the carrier.

(1) Note. The device may continue to support the load after moving it to the carrier; i.e., the load is not necessarily placed in supportive engagement with the carrier.

SEE OR SEARCH THIS CLASS, SUBCLASS:

255+, as a specific locus under subclass 253; see the reference thereto in subclass 659 above.

661 Push-pull device:

This subclass is indented under subclass 659. Apparatus wherein the device loads or unloads the carrier by pulling the load thereto or by pushing it therefrom, the movement of the load being relative to a supporting surface or member.

(1) Note. The carriers of this subclass frequently include means for gripping an edge or side of a load pallet.

SEE OR SEARCH THIS CLASS, SUBCLASS:

277+, as explained in subclass 659 above, and see particularly subclass 280 thereof.

662 Comprising means enabling additional movement of carrier or portion thereof relative to its support:

This subclass is indented under subclass 592. Apparatus wherein the loading or unloading means comprises a device for moving, or structure for facilitating the movement of, the carrier, or a part of the carrier, relative to its support in a direction which is in addition to the direction of its principal travel, which movement in an additional direction is primarily for a loading or unloading purpose.

SEE OR SEARCH THIS CLASS, SUBCLASS:

277+, for means for charging or discharging a plurality of static, load underlying members, which means includes a load-sustaining surface and a device to move the load in a direction which includes a horizontal component.

282+, for means for charging or discharging a plurality of static, load underlying members, which means includes a portable elevating device having a load-sustaining surface, and wherein there is also provided means to move the surface horizontally relative to the device.

659+, for a device located on the carrier for moving a load laterally to or from the carrier. (The device may supplant the carrier as the element which underlyingly engages the load).

663 On portable (e.g., vehicle-mounted, etc.) elevator:

This subclass is indented under subclass 662. Apparatus wherein the carrier is a component of an elevator or hoist which is supported in such a manner (e.g., as by being mounted on a vehicle) that it may be moved readily from one location to another.

(1) Note. See (3) Note of subclass 592.

SEE OR SEARCH THIS CLASS, SUBCLASS:

281+, for a means for charging a plurality of, or discharging a plurality of, load underlying member, e.g., racks, receptacles (or a compartmented receptacle), shelves, troughs, etc.) and wherein the means includes a portable elevating device having a load-sustaining surface.

SEE OR SEARCH CLASS:

187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, subclasses 222+ for a self loading or unloading industrial lift truck having a vertically moving load support which does not have either its load support mounted for movement in an additional direction (e.g., tilting) or an additional

means to load or unload the load support (e.g., power roller).

664 Carrier comprises spaced, elongated, horizontally coplanar, load-supporting members, at least one being movable:
This subclass is indented under subclass 663. Apparatus wherein the carrier has a load-supporting structure which consists of two or more elongated members, which members are spaced apart but lie in a single horizontal plane (e.g., the forks of a fork lift truck), one or more of the members being movable.

SEE OR SEARCH THIS CLASS, SUBCLASS:
282+, for a means for charging a plurality of, or discharging a plurality of, load underlying member, e.g., racks, receptacles (or a compartmented receptacle), shelves, troughs, etc., and wherein the means includes a portable elevating device having a load-sustaining surface, and wherein there is also provided means to move the surface horizontally relative to the device.
785, for the load-engaging elements, per se, of an elevator or hoist for which a loading or unloading means is provided.

665 Pivotable in horizontal plane:
This subclass is indented under subclass 664. Apparatus wherein the movement of the member or members includes that of pivoting in the horizontal plane.

666 And otherwise movable therein:
This subclass is indented under subclass 665. Apparatus wherein a pivotable member is additionally movable in another manner (e.g., shifting, sliding, etc.) in the horizontal plane.

667 Shiftable in horizontal plane perpendicularly to axis of elongation:
This subclass is indented under subclass 664. Apparatus wherein the movement of the member or members includes that of moving sideways (i.e., at 90° to its longitudinal axis) in the horizontal plane.

668 Carrier comprises spaced, elongated, horizontally coplanar, load-supporting members, at least one being movable:
This subclass is indented under subclass 662. Apparatus wherein the carrier has a load-supporting structure which consists of two or more elongated members, which members are spaced apart but lie in a single horizontal plane (e.g., the forks of a fork lift truck), one or more of the members being movable.

SEE OR SEARCH THIS CLASS, SUBCLASS:
785, as explained in the search note to this subclass (785) appearing in subclass 664 above.

669 Pivotable in horizontal plane:
This subclass is indented under subclass 663. Apparatus wherein the carrier has a load-supporting structure which consists of two or more elongated members, which members are spaced apart but lie in a single horizontal plane (e.g., the forks of a fork lift truck), one or more of the members being movable.

670 And otherwise movable therein:
This subclass is indented under subclass 669. Apparatus wherein a pivotable member is additionally movable in another manner (e.g., shifting, sliding, etc.) in the horizontal plane.

671 Shiftable in horizontal plane perpendicularly to axis of elongation:
This subclass is indented under subclass 668. Apparatus wherein the movement of the member or members includes that of moving sideways (i.e., at 90° to its longitudinal axis) in the horizontal plane.

672 Carrier comprises swingable or rotatable, load-underlying surface:
This subclass is indented under subclass 662. Apparatus wherein the carrier has a load-supporting structure in the form of a surface (e.g., a platform) upon which the load rests, and which surface is mounted upon an axis to which it is generally perpendicular and about which it may be pivoted, the angle of pivot being anything from a brief arc to a circle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

283, for plural, static structures which support discrete loads and charging or discharging means therefor, said means including a portable elevating device having a pivotable or rotatable load-sustaining surface.

673 Return, buffer, or counterweight feature:

This subclass is indented under subclass 592. Elevating devices comprising some means tending to return to carrier from dumping position, or a buffer of some kind, or a counterweight.

SEE OR SEARCH THIS CLASS, SUBCLASS:

601, for returns combined with run-out carriers.

602, for returns or buffers combined with inclined elevators.

719+, for similar devices combined with a vertically swinging load support.

SEE OR SEARCH CLASS:

16, Miscellaneous Hardware, subclasses 193+ and 216 for sash balancers and weights.

89, Ordnance, subclass 39 for gun mount counterpoises.

104, Railways, subclasses 249+ for buffers.

187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, subclasses 404+ for counterbalance means for an elevator car.

212, Traversing Hoists, subclasses 279, 178, and 195+ for cranes having counterweight or counterbalance features.

248, Supports, subclass 364 for counterbalance weights.

674 Automatic stop:

This subclass is indented under subclass 592. Elevating devices comprising means to automatically cut off the power, usually controlled by the movement of the carrier, or to not only stop but reverse the movement of the carrier.

SEE OR SEARCH CLASS:

91, Motors: Expansible Chamber Type, subclasses 358+ and 392+ for expansible chamber motors having means to stop the motor by controlling the motive fluid therefor in response to the position of the working member (e.g., piston).

187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, subclasses 282+ and 302+ for control means for the drive of an elevator car actuated by the car contacting a trip in the elevator shaft.

192, Clutches and Power-Stop Control, subclass 125 for stop mechanism, per se.

212, Traversing Hoists, subclasses 276+ for automatic stops for traversing hoists.

318, Electricity: Motive Power Systems, subclass 286 for electric motor reversing control in response to movement or position of motor or device driven thereby; subclasses 466+ for electric motor starting and stopping in response to movement, position, or limit of travel of motor or other body or device.

675 COUNTING AIDS:

This subclass is indented under the class definition. Apparatus comprising means for the reception and support of a plurality of articles to be counted and having indicia, particular configurations, barriers, etc., whereby the count of the articles received or a count of a portion of the articles received is readily ascertainable.

SEE OR SEARCH CLASS:

453, Coin Handling, subclasses 58+ for devices for counting coins.

676 ARTICLE SUPPORTED BY AIR AND MOVED BY MECHANICAL OR MANUAL MEANS:

This subclass is indented under the class definition. Apparatus having means whereby an article is supported proximately to an underlying surface by a column or columns of a gaseous medium issuing from the surface, and wherein the article is moved laterally relative to the sur-

face by mechanically or manually actuated means.

SEE OR SEARCH CLASS:

180, Motor Vehicles, subclasses 166+ for a collection of vehicles and art devices provided with means for maintaining a working fluid mass (e.g., an air cushion) between the vehicle or device and a reaction surface therebeneath.

406, Conveyors: Fluid Current, subclasses 86+ for fluid current conveyors having fluid means for maintaining the load in suspension while it is being moved by fluid or by gravity.

677 FEED TABLES FOR SHEARING MACHINES:

This subclass is indented under the class definition. Apparatus comprising mechanisms for advancing a load to a device which is to remove, by shearing, a portion of said load.

SEE OR SEARCH CLASS:

83, Cutting, appropriate subclass for the combination of a feed table and a cutting machine.

678 LAND VEHICLE OR BOAT TILTING AND LIFTING DEVICES:

This subclass is indented under the class definition. Apparatus comprising a device having a boat or land vehicle supporting means, which may be moved relative to another part of said device, whereby said supported boat or land vehicle may be reoriented.

SEE OR SEARCH CLASS:

114, Ships, subclasses 44+ for vessel raising and docking devices.

187, Elevator, Industrial Lift Truck or Stationary Lift for Vehicle, subclasses 203+ for a stationary lift for a roadway vehicle which only reciprocates along a linear path between two vertically spaced points.

254, Implements or Apparatus for Applying Pushing or Pulling Force, appropriate subclasses for a device which may raise a vehicle in a vertical direction.

679 VEHICLE WITH LOAD-RECEIVING PORTION AND MEANS FOR RELOCATING A LOAD THEREALONG OR THEREWITHIN:

This subclass is indented under the class definition. Apparatus comprising a vehicle which has a portion for receiving and transporting a load and is provided with means for moving a load consisting of material in relation to that portion, within the confines or limits thereof, for redistributing or otherwise relocating the load.

(1) Note. Material, as used herein, ordinarily comprises a commodity which is being handled in bulk; however, articles are within the scope of that term as long as they are not handled individually (i.e., as separate items).

(2) Note. This subclass is an outgrowth of the reclassification of subclass 82 of former Class 214. Since it is believed that similar art existed in, at least, subclasses 83+, 503, and 518+ of that class, now subclasses 507+ (other than 509+ thereof), 472 and 501+, respectively, the patents initially placed here may represent only a small portion of a potentially large body of art.

(3) Note. Included herein, in the absence of a more appropriate locus, is a body of art wherein the relocating of the load is for the purpose of making it more compact (i.e., compressing it).

SEE OR SEARCH THIS CLASS, SUBCLASS:

491+, for a self-loading or unloading vehicle having a load-receiving portion pivotable relative to the horizontal, and wherein is provided a driven means to move a load relative to the portion. Included therein is art wherein the means may serve only to move the load along or within the portion (i.e., the function of moving the load off or on to the vehicle is accomplished by the pivotable movement of the portion, rather than by the driven means).

508+, for a self-loading or unloading vehicle having a load engaging element recip-

rocably movable parallel to a generally horizontal load-supporting component of the vehicle for ejecting a load therefrom, which element may be closely related to the moving means found herein. This subclass (679) includes patents formerly classified in that area (509+), but which patents lack any indication that moving the load off the load receiving portion is contemplated.

754+, for article reorienting which may include the repositioning, by movement about one of its principal axes, of an article located on a vehicle.

SEE OR SEARCH CLASS:

100, Presses, subclass 100 for a portable (e.g., wheel-mounted) press.

680 VERTICALLY SWINGING LOAD SUPPORT:

This subclass is indented under the class definition. Apparatus including a load carrier swingable in a vertical plane.

SEE OR SEARCH THIS CLASS, SUBCLASS:

408, for a device for emptying a portable receptacle into a portable receiving means, which device includes a vertically swinging arm having pivotable attached thereto a support for the receptacle.

442, for a vehicle having a load handling means responsive to the motion of the vehicle, and wherein the means is a vertically swinging member which is operated by a wheel of the vehicle.

546+, for a self-loading or unloading vehicle having a load-handling means which moves a load in a curvilinear path.

565, through 569, for combinations of carriers, wherein one of the carriers involves a vertically swinging load holder or support.

815, for a process of material or article handling including a vertically swinging load support.

SEE OR SEARCH CLASS:

114, Ships, subclasses 373+ for swinging davits.

172, Earth Working, subclasses 439+ and 452+ for apparatus comprising vertically swinging lift arms for lifting earth-working implements or any implement claimed by name only if the manipulation of the implement is consistent with its use as an earth-working implement.

212, Traversing Hoists, subclasses 232+ and 255+ for vertically swinging load supports (booms) from which the load is suspended by a flaccid member. Class 212 is the residual locus for load handlers having a vertically swinging boom claimed without regard to a self-loading feature (see main definition, Class 212 and the search note to Class 414 thereunder).

681 Track-supported rocker:

This subclass is indented under subclass 680. Apparatus including a horizontally extending track and a member having a curved surface which engages said track, said carrier being fixedly secured to said member and the latter rocking on said track to swing the carrier in a vertical plane.

682 Horizontally swinging:

This subclass is indented under subclass 681. Apparatus wherein said track turns in a horizontal plane.

683 Cement mixer loader:

This subclass is indented under subclass 680. Apparatus wherein the load supported by said carrier is discharged into a cement mixer.

SEE OR SEARCH CLASS:

366, Agitating, subclasses 36 and 39 for the combination of a concrete mixer and a movable skip for loading it, the movement of the skip frequently describing a vertical arc.

684 Coil handler:

This subclass is indented under subclass 680. Apparatus wherein the load supported by said carrier is a roll.

684.3 Door remover:
This subclass is indented under subclass 680. Apparatus wherein the load carrier is adapted to engage and open a door by removing it from the doorway.

(1) Note. This subclass includes furnace door lifters previously classified in the class for traversing hoists.

SEE OR SEARCH CLASS:
49, Movable or Removable Closures, subclasses 210 and 324+ for a door remover permanently attached to the door.
110, Furnaces, subclass 176 for a door lifter claimed in combination with a furnace.
202, Distillation: Apparatus, subclasses 262+ for a door lifter claimed in combination with a coke oven.
212, Traversing Hoists, subclass 166 for a traversing hoist-type door remover.

685 Shovel or fork type:
This subclass is indented under subclass 680. Apparatus wherein said carrier is a scoop, or is formed of tines.

SEE OR SEARCH CLASS:
37, Excavating, subclasses 411+ for a scoop of that class.

686 With means to facilitate attachment of boom to vehicle:
This subclass is indented under subclass 685. Apparatus including an elongate, pivotally mounted member which supports said carrier for swinging motion in a vertical plane, said member or a support therefor being readily joinable to and detachable from a vehicle.

687 Horizontally swinging:
This subclass is indented under subclass 685. Apparatus including means for swinging said carrier in a horizontal plane.

688 Vertically adjustable:
This subclass is indented under subclass 687. Apparatus wherein said carrier is mounted on a member swingable in a vertical plane and adjustable bodily in a vertical direction.

689 Trolley supported pivoted handle:
This subclass is indented under subclass 687. Apparatus wherein said carrier is mounted on a member swingable in a vertical plane and pivoted to a car or other structure guided on ways.

690 Reciprocating handle:
This subclass is indented under subclass 687. Apparatus wherein said carrier is mounted on a member swingable in a vertical plane and capable of longitudinal reciprocation, as in the typical steam shovel.

691 Link supported:
This subclass is indented under subclass 690. Swinging devices wherein the reciprocating member is attached to its support by links.

692 Tilting:
This subclass is indented under subclass 690. Apparatus wherein said carrier is pivoted to said swingable member for tilting motion relative thereto.

693 Single cable for crowding and hauling:
This subclass is indented under subclass 690. Apparatus having a cable means to cause the load carrier support member to swing in the vertical plane and to reciprocate longitudinally.

694 Handle pivoted to boom:
This subclass is indented under subclass 687. Apparatus comprising a boom mounted to swing horizontally about an axis and having shovel or fork handle attached thereto by a fixed pivot.

695 Adjustable horizontal swing axis:
This subclass is indented under subclass 694. Apparatus having means by which the axis about which the boom is mounted to swing horizontally may be adjusted or repositioned.

695.5 Linear cylinder:
This subclass is indented under subclass 694. Apparatus provided with a reciprocating fluid-powered device for swinging the boom.

695.6 Flexible connector:
This subclass is indented under subclass 694. Apparatus provided with an elongate pliant force-transmitting member, e.g., rope, chain, etc., for swinging the boom.

695.7 Rack and pinion:
This subclass is indented under subclass 694. Apparatus provided with interengaging gearing, one gear of which is an elongate rigid member moving to or fro for swinging the boom.

695.8 Rotary motor:
This subclass is indented under subclass 694. Apparatus provided with a rotatable fluid-powered device for swinging the boom.

696 Guided:
This subclass is indented under subclass 685. Apparatus comprising means, such as a trolley and a track, for guiding said carrier or a vertically swingable support means therefor.

697 Tilting:
This subclass is indented under subclass 685. Apparatus in which said carrier is tiltable relative to a vertically swingable member on which it is mounted.

SEE OR SEARCH CLASS:
37, Excavating, subclasses 196+ for snow excavators, and subclasses 411+, especially subclasses 444+, for scoops. A scoop disclosed as having at least some portion thereof between the confines of a vehicle, e.g., located between the wheels, is classifiable in Class 37 even though mounted for tilting on a vertically swinging load support, but a scoop not limited by disclosure to use for snow excavating which is so mounted and is located clear of the vehicle is classifiable in these subclasses (697+) provided there are no specific features for excavating snow such as specifically claimed teeth.
172, Earth Working, subclasses 272+ for implements of that class with means to facilitate mounting them on a motor vehicle.

698 Including indicator:
This subclass is indented under subclass 697. Apparatus including special information giving means (e.g., indicia, a light, bell, etc., for the purpose of indicating a change of condition or position of the apparatus or a part thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
21, for apparatus under the class definition having weighing means.

SEE OR SEARCH CLASS:
116, Signals and Indicators, subclasses 309+ for indicators attached to or associated with some movable or adjustable devices to indicate the movement or adjustment or position of such devices.

699 Control means responsive to sensed condition:
This subclass is indented under subclass 697. Apparatus including a means to sense a condition or change of condition and a control means acting in response to the sensing to effect an operation of the apparatus.

(1) Note. Subject matter in which the condition sensed is one which is caused by a human operator for the proximate purpose of operating a control is not included. For example, if an operator pulls a rope for the purpose of operating a control (e.g., a latch) and the control (latch) acts in response to means sensing the tension on the rope, this is not included; but if a human operator pulls a rope for the member and the control (latch) acts in response to means sensing the tension on the rope which results from the swinging member reaching a certain position, this is included. However, the definition does include subject matter in which the condition sensed causes response of a control means for a device which caused the condition. For example, the condition sensed may be the position of a latch which position causes response of a control means for a servo motor which has been operated for the purpose of moving the latch.

(2) Note. Subject matter in which the condition sensed and the control means acting in response to the condition are mere cyclically recurring conditions of a machine (e.g., the valves of an internal combustion engine acting in response to

the position of the cams on the cam shaft) is not included.

SEE OR SEARCH THIS CLASS, SUBCLASS:

706+, especially 708, for apparatus where one means acts in response to the condition of another means but the means acting in response is not considered a control but rather a principal part of the apparatus such as an extensible link.

SEE OR SEARCH CLASS:

172, Earth Working, subclasses 2+ for apparatus that works the earth in situ and has automatic control of power means for changing a condition of operation of the apparatus.

700 To maintain pitch during swinging:
This subclass is indented under subclass 699. Apparatus having means to sense, as said swingable member pivots, a departure of said carrier from a predetermined attitude relative to the horizontal, and a control acting in response to the sensing to cause tilting of the carrier to return it to the predetermined attitude.

701 To stop tilting at selected angle:
This subclass is indented under subclass 699. Apparatus having means which, as tilting proceeds, senses that a predetermined angular relation of said carrier to said swingable member has been reached, and a control acting in response to the sensing to halt the tilting.

702 Overshot type:
This subclass is indented under subclass 697. Apparatus in which said carrier is movable by the motion of said swingable member through a position vertically above the center about which swinging occurs.

703 Swinging member attached to rear mounted draft member:
This subclass is indented under subclass 697. Apparatus including a drawbar or draft link pivotally attached to the rear of a tractor, such drawbar or draft link being vertically swingable by means of a link connecting it to a crank arm actuated by a motor in the tractor and the swingable member including or forming a continuation of the drawbar or draft link for movement therewith.

704 Including load ejector, striker, or retainer:
This subclass is indented under subclass 697. Apparatus having means movable relative to said carrier and contacting the load either (a) to tilt the carrier on said swingable member, or (b) to translate the carrier bodily sidewise.

705 Laterally tiltable or shiftable shovel or fork:
This subclass is indented under subclass 697. Apparatus in which said carrier is selectively adjustable transversely of the plane of vertical swing of said swingable member and such movement is either (a) to tilt the carrier on the swingable member, or (b) to translate the carrier bodily sidewise.

706 During swinging to stabilize pitch:
This subclass is indented under subclass 697. Apparatus including means requiring said carrier to keep or tend to keep a predetermined angular position relative to horizontal, while said swingable member pivots, by tilting the carrier relative to the swingable member.

SEE OR SEARCH THIS CLASS, SUBCLASS:

700, for such apparatus which have also a control for the tilting means which acts in response to a sensing of departure of the load engager from a predetermined attitude to return it.

SEE OR SEARCH CLASS:

182, Fire Escape, Ladder, or Scaffold, subclasses 2.1+ for structures supported in spaced relation to the earth's surface for supporting a workman in which a platform is maintained level on an angularly movable support.

707 On link mounted swinging support:
This subclass is indented under subclass 706. Apparatus in which the swinging member is pivotally supported on a link or lever which is pivoted on the base support of the apparatus.

708 By hydraulic compensation:
This subclass is indented under subclass 706. Apparatus in which the means for tilting said carrier includes a liquid-actuated expansible chamber motor and means for changing the

volume of liquid in the chamber of the motor in the amount required by the extent of motion of said swingable member.

(1) Note. The motor in this definition must be other than a motor used to cause swinging of the swinging member.

SEE OR SEARCH THIS CLASS, SUBCLASS:

700, for such devices where the means to change the volume as necessary includes a flow control responsive to a sensed position change of the load engager.

709 By tensioned flexible connector:
This subclass is indented under subclass 706. Apparatus in which the means for tilting said carrier includes a flexible component such as a cable or chain (a) extending along said swingable member, (b) connecting the carrier to the base support of the apparatus, and (c) held taut by the weight of the carrier.

710 By linkage pivoting on base support:
This subclass is indented under subclass 706. Apparatus in which the means for tilting said carrier comprises a linkage connecting the carrier to the base support of the apparatus, the linkage being pivoted to the base support and at least a portion thereof also being vertically spaced from and extending along said swingable member and swinging with it.

SEE OR SEARCH THIS CLASS, SUBCLASS:

709, for similar apparatus in which a fixed length flexible component tilts the load engager to substantially maintain the load engager in the predetermined attitude.

711 Yoke mounted shovel or fork:
This subclass is indented under subclass 710. Apparatus in which the linkage and the swingable member connect to the carrier through a carriage or intermediate support on which the carrier is secured for tilting relative to the swingable member and to which the carrier is pivotally connected for other tilting at a location spaced, when viewed in side elevation, from the connection of the linkage or the swingable member to the carriage.

SEE OR SEARCH THIS CLASS, SUBCLASS:

707, for apparatus in which the pitch stabilizing tilting of the load engager is relative to a swinging load support member which is intermediate a supporting link or lever and the load engager.

712 Linkage extensible for other tilting:
This subclass is indented under subclass 710. Apparatus in which the linkage comprises a link which on activation changes in length to tilt the carrier from the position relative to the horizontal in which the linkage maintained it during motion of said swingable member.

713 Swinging support mounted linkage:
This subclass is indented under subclass 712. Apparatus in which the linkage, at a location intermediate its connections to the carrier and the base support, is supported by said swingable member in a manner permitting relative movement of the latter and the linkage.

714 Induced by swing of swinging support:
This subclass is indented under subclass 697. Apparatus including means whereby the motion of said swingable member causes tilting of said carrier.

SEE OR SEARCH THIS CLASS, SUBCLASS:

706+, for devices in which the swinging of the support causes tilting of the load engager to maintain the load engager in a predetermined attitude to the horizontal.

715 By extensible link between load engager and swinging support:
This subclass is indented under subclass 697. Apparatus in which tilting of said carrier is caused by a change in length of a link connected between the carrier and said swingable member.

SEE OR SEARCH THIS CLASS, SUBCLASS:

712+, for a linkage which maintains the load engager in a predetermined attitude during swinging of the swinging

member and is extensible for further tilting of the load engager.

716 Holdable in different pitch positions during loading:
This subclass is indented under subclass 697. Apparatus having means by which said carrier can be selectively rigidly secured to said swingable member in different vertical angular positions relative thereto when the swingable member is in its lowest position, whereby the angle to horizontal which the carrier takes when it receives the load can be adjusted.

(1) Note. The securement of the load engager in different positions must prevent movement in any direction relative to the swinging member in any one position of adjustment.

SEE OR SEARCH THIS CLASS, SUBCLASS:
715, for a load engager adjusted relative to the swinging member by an extensible link.

717 On unlatching from swinging support:
This subclass is indented under subclass 697. Apparatus in which said carrier is fixed in position relative to said swingable member by a latch which, when operated to a release position, allows the carrier or a part thereof to tilt relative to the swingable member.

(1) Note. A latch under this definition is considered to be a restraining member which acts directly on the load engager or a part rigidly secured to the load engager and is disengaged from said load engager or part when in release position.

SEE OR SEARCH THIS CLASS, SUBCLASS:
716, for a load engager released for tilting by a latch and also adjustably holdable in different vertical angular positions relative to the swinging member.

718 Extensible support:
This subclass is indented under subclass 685. Apparatus comprising means for varying the distance between said carrier and the pivot of a vertically swingable member on which the carrier is mounted.

SEE OR SEARCH CLASS:
52, Static Structures (e.g., Buildings), subclass 118 for a telescopic vertically swinging elongated shaft, per se.
212, Traversing Hoists, subclasses 230+, 264, and 348+ for extensible booms claimed in combination with or having structure (e.g., cable passage or chaffing strip) peculiar to a crane.

719 Return, buffer, or counterweight feature:
This subclass is indented under subclass 685. Apparatus comprising (a) special means for returning to its normal position a vertically swingable member on which said carrier is mounted, or (b) a buffer mechanism, or (c) a counterweight mechanism.

SEE OR SEARCH THIS CLASS, SUBCLASS:
673, and the subclasses there noted, for similar devices.

SEE OR SEARCH CLASS:
212, Traversing Hoists, subclasses 279, 178+, and 195+ for counterbalanced devices.

720 Spring:
This subclass is indented under subclass 719. Apparatus having a resilient means which returns the vertically swinging member to its normal position.

721 Hay retainers:
This subclass is indented under subclass 685. Apparatus comprising means for retaining hay and the like upon said carrier.

722 Shovel, rake, handle, or boom structure:
This subclass is indented under subclass 685. Apparatus including details of the construction of (a) a scoop or tines forming said carrier, or (b) an elongate, pivotally mounted member which supports said carrier for swinging motion in a vertical plane.

723 With means to facilitate attachment of shovel or rake to handle or boom:
This subclass is indented under subclass 722. Apparatus wherein said carrier is readily joinable to and detachable from said elongate member.

(1) Note. Included here are swingable arms joined at their free ends to a crossbar having means for releasably attaching tines thereto to form a rake.

724 Handling device releasably attached to bucket or rake:
This subclass is indented under subclass 722. Apparatus including a separate material or article handling device which is readily joinable to and removable from said carrier, e.g., a clamping device attachable to an excavating bucket so that the two members can be used together to lift logs, or a bucket attachable to tines.

SEE OR SEARCH THIS CLASS, SUBCLASS:
722, for a material handling device permanently mounted on a shovel or rake and movable between operative and inoperative positions, e.g., tines swingably mounted on a scoop so that they are movable between a working position wherein they project from the loading edge of the scoop, and a retracted position wherein they are above the scoop.

725 Means for ejecting load from shovel:
This subclass is indented under subclass 722. Apparatus including means for forcing a load out of said scoop.

726 Shovel forming members pivoted relative to each other to dump load:
This subclass is indented under subclass 722. Apparatus wherein said scoop is formed of two members which swing apart to discharge a load.

727 Handle body structure:
This subclass is indented under subclass 722. Apparatus including details of the construction of the wall plates, stringers, or like members which form the longitudinally extending body portions of said elongate supporting member.

728 With rectilinear translation:
This subclass is indented under subclass 680. Apparatus having means whereby the vertically swingable load engaging carrier additionally is given a linear motion.

729 Grab:
This subclass is indented under subclass 680. Apparatus in which the vertically swingable load carrier includes a seizing, grasping, or clamping means to engage and secure the load against movement relative thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:
1+, for gripper means on the end of a remote control arm.
555, for a self-loading or unloading vehicle having a load handling means which raises or lowers a load in a path which includes curvilinear movement, and wherein the handling means includes means to grasp the load.
618+, for a grab associated with an elevator or hoist.
744.8+, for gripper means associated with pipe handling means.
796.9+, for gripper means for removing an article from a stack.

SEE OR SEARCH CLASS:
74, Machine Element or Mechanism, for various gear and lever and linkage movements.
294, Handling: Hand and Hoist-Line Implements, for specific article gripping means.
318, Electricity: Motive Power Systems, for electric motors and controls therefor.

730 Programmable or condition responsive means controls grab operation:
This subclass is indented under subclass 729. Apparatus having means to activate said seizing, grasping, or clamping means into or from a load-engaging condition by or under the control of a preestablished sequencing means such as a template, cam, electromagnetic tape, etc., responsive to a condition which may or may not exist, etc.

731 With auxiliary support for load:
This subclass is indented under subclass 729. Apparatus having means to assist the load seizing, grasping, or clamping means and removed therefrom to act on the load, either in terms of stabilizing the load or aiding in the support of the load.

732 Grab movable relative to its supporting arm:
This subclass is indented under subclass 729. Apparatus having lever means pivotable in a vertical plane about an axis and which imparts a vertically swinging movement to said load seizing, grasping, or clamping means which is attached for relative movement to said lever means at a point removed from said axis.

733 Grab orientation maintained during supporting arm manipulation:
This subclass is indented under subclass 732. Apparatus having means whereby the load seizing, grasping, or clamping means is maintained in a predetermined orientation during the time when it is caused to swing in a vertical plane by said lever means.

734 Grab suspended to swing freely:
This subclass is indented under subclass 733. Apparatus wherein the grab is secured to the supporting arm by a free swivel or freely swingable joints so that orientation of said grab is maintained because of the effect of gravity thereon.

735 Grab has swinging movement in plural planes:
This subclass is indented under subclass 732. Apparatus having means whereby the load seizing, grasping, or clamping means may rotate about an axis which lies in the vertical plane in which said lever means is pivoted to swing.

736 Movable grab support has plurality of grabs attached thereto:
This subclass is indented under subclass 729. Apparatus having lever means pivotable in a vertical plane about an axis and which imparts a vertically swinging movement to a plurality of load seizing, grasping, or clamping means attached to said lever means.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclasses 87.1+ for multiple object grappling means.

737 Grab is a suction or magnetic article engaging means:
This subclass is indented under subclass 729. Apparatus wherein the load is seized by magnetic force means or by the force resulting from the establishment of a region of unequal fluid pressures.

SEE OR SEARCH THIS CLASS, SUBCLASS:
606, for an elevator or hoist and loading or unloading means therefor, and wherein a magnet lifts an object of magnetically attractive material for seizure by a grapple.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclasses 64.1+ and 65.5 for vacuum and magnetic means associated with implements for handling articles.

738 Grab supported and moved by a pivotably mounted member:
This subclass is indented under subclass 729. Apparatus in which a lever means comprising either a single unitary member or a plurality of pivotably interconnected members, is swingable in a vertical plane about an axis located at one point thereon, and said load seizing, grasping, or clamping means is attached to said single member at a point thereon removed from said axis.

739 Grab has pivoted jaw member:
This subclass is indented under subclass 738. Apparatus in which the load seizing, grasping, or clamping means includes at least one pivotally mounted member which may be pivoted into engagement with the load.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclasses 106+ for handling implements having pivoted jaw grapples.

740 With fixed jaw member:
This subclass is indented under subclass 739. Apparatus in which the load seizing, grasping, or clamping means also includes an immovably mounted jaw member which couples with the pivoted jaw member so that a load may be grasped between said two jaw members.

741 Grab has reciprocating jaw member:
This subclass is indented under subclass 728. Apparatus in which the load seizing, grasping, or clamping means includes at least one member mounted to move linearly so as to be brought into engagement with a load to secure said load against relative movement therewith.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclasses 86.4+, and particularly subclasses 92 and 103.1+, for implements having a rigid gripper or a gripper having a fixed and movable jaw.

742 Nonfixed pivot:
This subclass is indented under subclass 680. Apparatus having a lever means pivotable in a vertical plane about an axis which may be moved from a given point, said lever means imparting a vertically swinging movement to said load carrier which is supported for movement by said means at a point on said lever means removed from said axis.

743 Tilting carrier:
This subclass is indented under subclass 680. Apparatus having lever means pivotable in a vertical plane about an axis and imparting a vertically swinging movement to said load carrier, said load carrier being movable relative to said lever means and supported thereby at a point removed from said axis.

744.1 HORIZONTALLY SWINGING LOAD SUPPORT:
This subclass is indented under the class definition. Apparatus including means to hold material and transport that material along an arcuate path in a level plane.

SEE OR SEARCH CLASS:
104, Railways, subclasses 35+ for turntable construction.
198, Conveyors: Power-Driven, subclass 803.16 for a rotary conveyor, generally.
258, Railway Mail Delivery, for means particularly adapted to transfer a mail bag, train orders, or the like to or from a moving vehicle.

744.2 Swinging about pivot:
This subclass is indented under subclass 744.1. Apparatus wherein the means to hold and transport material turns about a vertical axis.

744.3 And moving vertically:
This subclass is indented under subclass 744.2. Apparatus wherein the means to hold and transport also moves the material up or down.

(1) Note. Vertical movement of the device of this subclass is generally rectilinear.

SEE OR SEARCH THIS CLASS, SUBCLASS:
680+, for apparatus to hold material and transport that material along an arcuate path in a vertical plane, including a load support that swings both vertically and horizontally.

744.4 Moving pivot:
This subclass is indented under subclass 744.2. Apparatus wherein the vertical axis about which the material is transported is relocated horizontally.

SEE OR SEARCH THIS CLASS, SUBCLASS:
744.6, for means to transport a load including a load support swinging about a vertical axis and moving radially with respect thereto.

744.5 Pivot swinging about second pivot:
This subclass is indented under subclass 744.4. Apparatus wherein the means to hold and transport material turns about a first vertical axis and wherein that vertical axis is turns about a second vertical axis.

744.6 And moving load support radially with respect to pivot:
This subclass is indented under subclass 744.2. Apparatus wherein the means to hold and transport material also moves toward or away from the vertical axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:
680+, for apparatus to transport material by swinging in a vertical plane.
744.3, for apparatus to transport material while moving about an axis and moving generally rectilinearly vertically.
744.4+, for means to transport material including a load support that pivots about a moving axis.

744.7 And vertically reorienting load support:
This subclass is indented under subclass 744.2. Apparatus including means to allow the means holding the material to turn about a nonvertical axis.

(1) Note. The additional movement of this subclass may serve to dump the material, or may make the material accessible.

744.8 With means to actuate load gripper:
This subclass is indented under subclass 744.2. Apparatus including means to move toward the material and enhance friction therewith to secure the material to the holding means and including structure to effect such friction enhancing movement.

745.1 CYLINDRICAL BAR HANDLING DEVICE:
This subclass is indented under the class definition. Apparatus having means to move or manipulate an elongated member of circular cross-section.

745.2 Vertical cylindrical bar:
This subclass is indented under subclass 745.1. Apparatus wherein the elongated member is oriented so that its axis extends normal to the horizon.

SEE OR SEARCH THIS CLASS, SUBCLASS:
22.51+, for structure for moving a pipe or rod to or from racked or storage position over a well.

745.3 Heat exchanger tube bundle handling device:
This subclass is indented under subclass 745.1. Apparatus particularly adapted to move or manipulate an assembly of hollow cylindrical bars used to transfer thermal energy from a fluid inside to a fluid outside the hollow bars.

SEE OR SEARCH CLASS:
29, Metal Working, subclass 726.5 for apparatus engaging to tube bundle and engaging a heat exchanger shell to bring them into assembly.

745.4 Pipe laying:
This subclass is indented under subclass 745.1. Apparatus particularly adapted to placing a hollow rod in a particular horizontal alignment.

(1) Note. Normally, the alignment of the pipe of this subclass is alignment with a string of pipes, but no intended contact is made by the means to move or manipulate with a coaxial pipe.

SEE OR SEARCH CLASS:
29, Metal Working, subclass 237 for means to move or manipulate a pipe into alignment with a string of pipes, with means to engage the string and draw the manipulated pipe thereto.
405, Hydraulic and Earth Engineering, subclass 154.1 for subterranean or submarine pipe or cable laying, retrieving, manipulating, or treating.

745.5 Vehicle having supporting wheel or wheel substitute:
This subclass is indented under subclass 745.4. Apparatus comprising a mobile device riding on a roller or on means function as a roller.

(1) Note. A wheel substitute includes an orbiting tread, e.g., an endless track is considered to be a wheel substitute, a sled runner is not.

745.6 Side boom supported hoist line:
This subclass is indented under subclass 745.5. Apparatus wherein the supporting wheel or wheel substitute and the vehicle generally are aligned parallel with the pipe including a tower member on and laterally extending from the vehicle from which a line is suspended to move or manipulate a pipe.

745.7 Sequentially acting, diverse handling devices:
This subclass is indented under subclass 745.1. Apparatus comprising a first means to move or manipulate an elongated member of circular cross-section and a second, later functioning, means that functions differently to move or manipulate the elongated member.

745.8 Changing orientation of cylindrical bar:
This subclass is indented under subclass 745.7. Apparatus including provision to change the direction of the member.

745.9 Including ramp and elevator means:
This subclass is indented under subclass 745.7. Apparatus wherein one of the means to move or manipulate comprises a plane over which the elongated member is adapted to roll, and the other means to move or manipulate comprises means to engage and raise or lower the elongated member against the force of gravity.

SEE OR SEARCH THIS CLASS, SUBCLASS:
745.1, for a cylindrical bar handling device having a lifting means with an integral ramp.

746.1 Oscillating or reciprocating elevator:
This subclass is indented under subclass 745.9. Apparatus wherein the elevator moves to and fro either along an arcuate or a straight path.

746.2 Oscillating:
This subclass is indented under subclass 746.1. Apparatus wherein the elevator moves to and fro along an arcuate path.

746.3 Including means to rotate or allow rotation of bar about its axis:
This subclass is indented under subclass 745.7. Apparatus including means to effect or permit movement of the elongated member about its cylindrical axis more than 360°

746.4 Including ramp and retractable stop or ejector:
This subclass is indented under subclass 745.1. Apparatus wherein the means to move or manipulate comprises a plane over which the elongated member is adapted to roll, which plane is provided with a movable barrier to block movement of an elongated member thereover.

SEE OR SEARCH THIS CLASS, SUBCLASS:
745.9, for similar structure wherein the barrier device also raises the elongated member.

746.5 Engaging interior surface of pipe:
This subclass is indented under subclass 745.1. Apparatus wherein the elongated member is hollow along its axis and wherein the means to move or manipulate comprises structure to engage the interior surface thereof.

746.6 Comprising walking beam:
This subclass is indented under subclass 745.1. Apparatus including a first material engaging member that is elongated to bodily support and advance a portion of conveyed material and including a second material that also is elongated to bodily support and advance a portion of conveyed material, wherein the two members are generally parallel and coextensive and function such that one moves to engage and advance the material, then as it pulls away from the material, the other elongated member moves to engage and advance the material wherein the elongated members remain oriented parallel with each other and with the direction of material advance.

(1) Note. The elongated members of this subclass may orbit while facing in a single direction, rather than move to-and-fro along a fixed path.

746.7 Comprising roller or endless belt:
This subclass is indented under subclass 745.1. Apparatus including means in engagement with the elongated member comprising (a) an annular member having a peripheral surface that rollingly engages the member, or (b) a bandlike member that travels along its periphery to engage the member in the manner of a roller.

746.8 Comprising carriage:
This subclass is indented under subclass 745.1. Apparatus including a member engaging holder that travels with the member.

749.1 LOAD CARRIED ALONG A HORIZONTAL LINEAR PATH (E.G., PICK AND PLACE TYPE):
This subclass is indented under the class definition. Subject matter having means to move an item in a plane parallel to a floor from one location to a chosen stopping place.

(1) Note. The item is being moved for the purpose of establishing a definite alignment between the item and the stopping place.

(2) Note. Included in this subclass are patents in which there is no specific destination disclosed (i.e., conveyor, table, workstand).

(3) Note. Excluded from this subclass are articles on a cart that travel along a track.

SEE OR SEARCH THIS CLASS, SUBCLASS:
222.01, for apparatus for charging a load holding or supporting element from a source, and means for transporting the element to a working, treating, or inspecting station.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 339.1 for conveyors and means specifically provided for the purpose of aiding the working, treating, or inspecting of the load by separate means at a station situated along the conveying path; subclass 373 for conveyor means for moving an article along a predetermined path with means to change the posture of said article relative to the conveyed direction; subclass 621.1 for load simultaneously engaged between and moved by a plurality of driven conveyor members having a reciprocating member; subclass 717 for pusher conveyor and separate load support surface; and subclass 750.1 for reciprocating conveying surface.

749.2 Carried via magnetic floating:
This subclass is indented under 749.1. Subject matter in which, during movement, the item is suspended in the air by means of a device that utilizes the attractive-repulsive nature of certain materials or of electricity.

SEE OR SEARCH CLASS:
104, Railways, subclass 281 for a magnetically suspended car.

749.3 Including a detector for altering load path (e.g., stop, redirect):
This subclass is indented under 749.1. Subject matter whereby a sensor halts or changes the item's direction of travel.

749.4 Multiple loads, rotatable into various positions (e.g., indexing):
This subclass is indented under 749.1. Subject matter in which more than one item is on a single carrier that is turnable in order to have the one item relocated.

749.5 Multiple loads, having means spacing one load from another load:
This subclass is indented under 749.1. Subject matter in which a carrier having multiple items has a device that separates one item a particular distance from an adjacent item.

749.6 Including aligning structure (e.g., rollers and rails, dovetail joint, rod and channel):
This subclass is indented under 749.1. Subject matter in which the moving means has at least two mating portions to facilitate proper orientation.

751.1 Having gripper means:
This subclass is indented under 749.1. Subject matter which includes the item holding,

seizing, grasping, clamping, or clutching means.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 468.2 for reciprocating conveyor having load gripping elements.
294, Handling: Hand and Hoist-Line Implements, subclass 86.4 for handling implements having grapple means.

752.1 Using suction:
This subclass is indented under 751.1. Subject matter wherein the holding, seizing, grasping, clamping, or clutching means is a device that reduces the atmospheric pressure at the item contact point.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 468.2 for reciprocating conveyor having suction gripping elements.
294, Handling: Hand and Hoist-Line Implements, subclass 64.1 for handling implements adapted to employ the use of a vacuum.

753.1 Pivoted jaw type:
This subclass is indented under 751.1. Subject matter in which the item grasping means comprises at least two members adapted to be moved about an axis, wherein the item is engaged between one member and at least the other member.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclass 106 for implements having pivoted jaw grippers.

754 ARTICLE REORIENTING DEVICE:
This subclass is indented under the class definition. Apparatus comprising means the sole function of which is to move an article to affect a change in its orientation.

(1) Note. The reorientation devices found in this and indented subclasses may cause the article being reoriented to move from one place to another. However, the movement is no more than the necessary manipulative function of the device needed to accomplish the desired reorientation of the article; or, the movement is to place or displace an article in a particular manner or with reference to a particular support. The support may be a broadly claimed conveying means, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
431+, for means to engage an article between the end thereof for rotation and advancement of the article.
816, for a process of reorienting an article.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclasses 373+ for conveyor systems for changing the attitude of items conveyed relative to the conveyed direction.
406, Conveyors: Fluid Current, subclass 87 for means to convey articles by a fluid current and to orient the articles.

755 Article reoriented by contact with fluid means:
This subclass is indented under subclass 754. Apparatus wherein the article is reoriented because of its becoming engaged by or with a fluid material.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 380 for conveyor systems having pressurized fluid means for changing the attitude of conveyed articles.

756 Article reoriented by flexible sling means:
This subclass is indented under subclass 754. Apparatus wherein said means includes an elongated flexible member adapted to bear against or to support said article whereby movement of at least a portion of said flexible member causes reorientation of the article.

757 Article frictionally engaged and rotated by relatively movable means (e.g., disc, endless belt, etc.):
This subclass is indented under subclass 754. Apparatus comprising a means driven to move relative to the article, and upon contact between the article and the driven means, said article may be reoriented.

(1) Note. The driven means may or may not support the article.

SEE OR SEARCH THIS CLASS, SUBCLASS:
433, for roller-type article rotating means.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 415 for conveyor systems for reorienting a conveyed item by means of plural, unequal-speed members simultaneously contacting and conveying the item.

758 Article inverting means (i.e., 180° turnover):
This subclass is indented under subclass 754. Apparatus wherein the reorienting means is designed to rotate an article 180° about any given axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:
403+, for a device for emptying (e.g., by dumping) a portable receptacle, and in particular, see subclasses 405, 419+, and 425 thereunder.

759 Plural, driven turning means coact sequentially to invert single article:
This subclass is indented under subclass 758. Apparatus wherein the inverting means comprises a plurality of article turning devices which cooperate to, in succession, turn a given article whereby the sum of the turning actions on the article of all said devices results in a complete inversion of the article.

760 Article slidably traverses sloping surfaces on a plurality of pivotally mounted turning means:
This subclass is indented under subclass 759. Apparatus wherein each of the article turning devices are trough shaped members which are rotatable to cause an article supported therein to turn, and which further cooperate with one another whereby the article turned by one of the members will cause the article to slide to another of the members to be turned additionally.

761 Inverter has plural means for receiving articles:
This subclass is indented under subclass 758. Apparatus wherein the inverting means is equipped to invert a first article and to receive another article for inversion before or simultaneously with the discharge or removal of said first article from said means.

762 Having article inserting or discharging means:
This subclass is indented under subclass 761. Apparatus wherein the inverting means is provided with means which either assists in causing, or does in fact cause, the article to be properly placed on or removed from the inverting means.

763 Having article gripping means:
This subclass is indented under subclass 761. Apparatus wherein means is provided whereby the article to be inverted is gripped for positive movement with the reorienting means.

764 Encircling means inverts article:
This subclass is indented under subclass 758. Apparatus wherein the inverting means encircles the article, lying in at least one plane which passes completely through the article.

SEE OR SEARCH THIS CLASS, SUBCLASS:
419+, for a receptacle emptying device in the nature of a rotary cradle, which has a motion similar to the means of this subclass.

765 Having article inserting or discharging means:
This subclass is indented under subclass 764. Apparatus wherein the inverting means is provided with means which either assists in causing, or does in fact cause, the article to be properly placed in or removed from the inverting means.

766 Having securing means movable into engagement with the article:
This subclass is indented under subclass 764. Apparatus wherein the inverting means is provided with article engaging means movable relative to the inverting means.

767 Encircling means moves about its transverse axis:

This subclass is indented under subclass 764. Apparatus wherein the inverting means is rotatable about an axis which extends through that portion of the inverting means which surrounds the article.

768 Article turned about one end supported by a fixed or rotatable abutment or by a surface frictionally retarding movement of the supported end:

This subclass is indented under subclass 758. Apparatus wherein the inverting means comprises (a) a means to support the article, at a point about which it may pivot to be inverted, and simultaneously present a resistance to lateral movement of said article, and (b) a means to exert a force against a portion of the article other than the pivot point so that said article is caused to turn about said pivot point.

SEE OR SEARCH THIS CLASS, SUBCLASS:

425, for a receptacle emptying device having similar motion.

769 Article turned about a rotatable abutment:

This subclass is indented under subclass 768. Apparatus wherein the means forming the support and pivot point for the article to be inverted is a pivotally mounted member.

770 Article turned about a fixed abutment means:

This subclass is indented under subclass 768. Apparatus wherein the means forming the support and pivot point for the article to be inverted is an immovable means which holds said article against all but pivoting movement.

771 Including coacting opposed movable arms:

This subclass is indented under subclass 758. Apparatus wherein the inverting means includes a plurality of members which cooperate to engage the article to be inverted.

772 Article moved about perpendicular axes:

This subclass is indented under subclass 758. Apparatus having means whereby the article may be inverted and manipulated about perpendicular axes.

773 Article received at one point and discharged at a different point:

This subclass is indented under subclass 758. Apparatus wherein the inverting means simultaneously performs the dual operation of (a) displacing an article from one point to another in a particular manner or with reference to a particular support, and (b) inverting the article so handled.

SEE OR SEARCH THIS CLASS, SUBCLASS:

1+, and 729+, for swinging or movable crab means which may be used to reorient an article.

774 Plural article turning members coact sequentially to reorient single article:

This subclass is indented under subclass 754. Apparatus wherein the reorienting means comprises a plurality of article turning means arranged so that one cooperates with another whereby an article is turned an increment by one turning means and is passed therefrom to another turning means to attain the final desired orientation of said article.

775 Article deposited on stationary supporting surface intermediate sequential turning members:

This subclass is indented under subclass 774. Apparatus having means whereby the article being reoriented is staged on a fixed supporting means intermediate a plurality of said turning means between which said article is passed.

776 Arm for orienting article is swingable about its traverse axis and is rotatable about its longitudinal axis:

This subclass is indented under subclass 754. Apparatus wherein the reorienting means includes an elongated means which supports said article and which is movable about perpendicular axes.

777 Roller means circumferentially engages and supports orienter for rotation thereon:

This subclass is indented under subclass 754. Apparatus wherein the means engaging and reorienting the article is rotatably supported on a rotatable means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

433, for roller-type means for rotating an article.

778 Article support means rockable on fixed surface:

This subclass is indented under subclass 754. Apparatus having a supporting surface means upon which the reorienting means may be caused to move with a rocking motion.

SEE OR SEARCH CLASS:

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclass 94 for rocking lifting devices.

779 Article support means rotates about a shiftable pivot point:

This subclass is indented under subclass 754. Apparatus wherein the reorienting means causes the article to rotate about an axis which may be moved along a given path of movement.

780 Fixed member provides support for article reoriented while in contact therewith:

This subclass is indented under subclass 754. Apparatus wherein the reorienting means comprises (a) a means to support the article, at a point about which it may pivot to be reoriented, and to simultaneously present a resistance to lateral movement of said article, and (b) a means to exert a force against a portion of the article other than the pivot point so that said article is caused to turn about said pivot point.

SEE OR SEARCH THIS CLASS, SUBCLASS:

425, for a receptacle emptying device having similar motion.

781 Article reoriented while fully supported by stationary supporting surface:

This subclass is indented under subclass 754. Apparatus wherein the article is caused to roll or rotate on the surface which supports it for the purpose of reorienting the article.

SEE OR SEARCH THIS CLASS, SUBCLASS:

433, and 749.1, for transfer devices which cause an article to move in a particular manner to or from a particular support by rolling said article on its supporting surface.

768, for articles inverted about one end supported by a fixed or rotatable abutment.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclasses 717+ for conveying devices including pushing means for moving a load on a load-supporting surface.

782 Article supporting carriage moved over fixed guideway to reorient article:

This subclass is indented under subclass 754. Apparatus wherein the reorienting means comprises a carriage means, which directly supports the article, and a guideway having a particular configuration such that, as the carriage is moved over the guideway, the article will be reoriented.

783 Orienter has article gripping means:

This subclass is indented under subclass 754. Apparatus having means to grip the article while it is being reoriented.

784 Orienter having article-supporting surface movable relative to article:

This subclass is indented under subclass 754. Apparatus in which the reorienting means includes a means which is (a) capable of directly supporting at least a portion of the article to be reoriented, and (b) movable relative to the article while said article is being supported by said reorienting means.

785 LOAD-ENGAGING STRUCTURE OF ELEVATOR OR HOIST DEVICE WITH LOAD HANDLING FEATURE:

This subclass is indented under the class definition. Apparatus comprising those elements of a means for raising or lowering a load which are in direct engagement with the load, and in particular, the structural characteristics of such elements.

(1) Note. The above-described subcombination is classifiable here only to the extent that it is not elsewhere provided for.

(2) Note. The line between a material handling device proper for this Class (414)

and an elevator or industrial lift truck proper for Class 187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, is as follows: (a) Class 414 provides for load engaging structure in which the load support surface travels in a generally vertical primary lift direction and (1) is mounted for movement in a direction other than the primary lifting direction (e.g., tilting) or (2) has an additional load handling structure (e.g., conveyor) or (3) is constructed in such a manner that the load support surface is inherently self-charged or self-discharged along the primary lift direction; and (b) Class 187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle provides for industrial lift trucks or components thereof when the load is shifted in its entirety in a primary lifting direction from one level to another vertically spaced level and may additionally include (1) mere pivoting or tilting of the load supporting structure for detachment or storage or (2) retaining of a received load on the support surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

592+, for the combination of an elevator or hoist and a loading or unloading means therefor, and wherein may be included specific, load-engaging structure. (The art of the newly reclassified portions of the subclass 592 area, i.e., subclasses 628+, 630+, 659+, 662+, and 785, has been cross-referenced here (785) where appropriate).

SEE OR SEARCH CLASS:

187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, subclass 237 and 401+ for an industrial lift truck or elevator, having load engaging structure (See above line note for distinction).

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 35+ for vehicle pushers which may be used to move a vehicle to or from an elevator.

294, Handling: Hand and Hoist-Line Implements, appropriate subclasses for load-engaging means having hand or hoist line terminals.

787 MISCELLANEOUS:

This subclass is indented under the class definition. Apparatus not otherwise classified above.

788 APPARATUS FOR MOVING INTERSUPPORTING ARTICLES INTO, WITHIN, OR FROM FREESTANDING, ORDERLY LAYERED, OR MUTUALLY STABILIZING ORDERLY GROUP:

This subclass is indented under the class definition. Apparatus for (a) placing an article in, (b) shifting an article relative to others within, or (c) removing an article from a particular location in an assemblage of contacting articles formed or taken apart at a site, wherein (A) each article of the assemblage must at least partially sustain, or must be at least partially sustained by, an adjacent article of the assemblage for a portion of the time the articles are in contact with each other and (B) the complete assemblage is either (i) capable of maintaining its shape without support in the horizontal direction on the articles from external confining structure (e.g., receptacle walls, inclined shelf), (ii) transportable as a unit from the site and composed of plural articles located within each of at least two layers* forming it, or (iii) entirely composed of articles which would each be unsteady, or relatively unsteady (i.e., they have a more stable attitude), if placed by themselves in the particular predetermined location in which they are at least partially held by the sustaining force exerted thereon by adjacent articles.

(1) Note. See the Glossary at the end of this subclass definition.

(2) Note. Apparatus for moving articles into, within, or from an assemblage in which the articles composing it are all used in their assembled form for the function they were manufactured (e.g., bricks stacked to form a wall) is not proper for this and the indented subclasses. The apparatus proper for this area forms assemblages to facilitate either the transporting of the articles as a

unit between locations or the storage of the articles in a nonuse position.

(3) Note. Articles in adjacent distinct levels* or layers* of a stack* must touch each other or an article supported separator therebetween to be considered proper for this and the indented subclasses. Articles in a horizontally extending arrangement which have their bottoms touching a common supporting structure must be both touching and intersupporting each other to be proper for this and indented subclasses. Moreover, if the articles in the horizontally extending arrangement utilizes vertical supporting or confining structure (e.g., walls) to maintain a stable arrangement, then to be proper for this and indented subclasses the arrangement must be composed entirely of articles which are in one of their less stable attitudes (e.g., a sheet on its edge) in the particular predetermined position they maintain while in the assemblage.

(4) Note. The line between this class (414) and Class 198, Conveyors: Power Driven, relative to apparatus for placing articles into or removing them from an intersupporting group is as follows: Class 198 takes such apparatus when (a) it consist of a power driven or gravity conveyor, (b) the site on which the group is supported is a horizontally extended conveyor surface, and (c) the group is formed on the surface of the conveyor while the conveyor both moves and transports the articles in a horizontal direction; and Class 414 takes such apparatus even if it consist of a conveyor(s) proper for Class 198 when either (a) the site on which the group is supported is other than a conveyor proper for Class 198 (e.g., an elevator, a shelf) or (b) the site on which the group is supported is a conveyor surface which has been fully stopped while each article is added to the group.

(5) Note. The line between this class (414) and Class 221 relative to article stacking, unstacking, or arranging is as follows: (a) Class 221 takes article piling (stack* forming) where the pile thus formed is the supply source for a subsequent dispensing operation (not merely the reverse operation of the pile or stack* forming means) of the kind provided for in Class 221; (b) Class 221 takes article unpiling (dispensing) coming within the scope of the class; (c) Class 414 takes article piling apparatus which is disclosed as being capable of unpiling as well either by reverse operation of the piling apparatus or by reverse operation thereof together with some additional means.

(6) Note. An intersupporting group having its articles both placed in and removed from the site as individual articles is <u>not</u> considered proper for this and the indented subclasses if the articles are (a) placed into the intersupporting group at one location, (b) sequentially travel in a stream in the order they are added to the group between this location and another horizontally spaced location while being moved by either (a) the force or gravity along a guiding or supporting structure (e.g., inclined shelf) or (b) driven conveying means, and (3) removed from the group at the second location. Such art is classified elsewhere based on the type of supporting or guiding structure (e.g., 414-150, 414-276, 414-328) or conveying means (e.g., Class 198, 414-564) which exist between the two locations. However, an intersupporting group wherein the articles therein travel sequentially in a stream between two vertically aligned spaced locations is proper for this and the indented subclasses when the group is composed entirely of articles in a stable attitude (i.e., either the group is self supporting or could be self supporting).

(7) Note. The line between this class (414) and Class 53, Package Making, relative to apparatus for arranging intersupporting articles into groups for packing is as follows: (1) Class 53 takes the apparatus when (a) a group is formed within a final package, (b) a group formed is subsequently directed or placed within a claimed final package, or (c) a group

formed is subsequently directed or placed onto claimed structure explicitly designed to engage a final package (e.g., a chute with bag supporting clip), and (2) Class 414 takes the apparatus when (a) group formed is intended to be subsequently, placed into a nonclaimed final package or (b) the group formed is placed into or onto transport structure which is not a final package proper for Class 53 (e.g., shipping pallets).

(8) Note. The line between the art for stacking or unstacking sheets found in this and the indented subclasses of Class 414 and that found in Class 271, Sheet Feeding and Delivering, was at best nebulous prior to this project (8603M9125). During this project the classifier discussed the line with three examiners expert in the material handling arts (i.e., Mr. Valenza representing Class 198, Mr. Stoner representing Class 271, and Mr. Paperner representing Class 414) and establishing the following line: (1) Class 271 provides for the stacking and unstacking of either (a) individual sheets of unfolded paper, (b) packets of similar sheets of paper attached together or individual folded sheets of paper (e.g., signatures) when the thickness of each packet or folded sheet of paper is substantially uniform and any variation thereof is not utilized during the stacking or unstacking operation and (c) thin, substantially flat, nonfood articles when at least one of the articles to be stacked or unstacked is temporarily bent or flexed during the handling thereof; (2) Class 414 provides for the stacking or unstacking of either (a) sheet-like food articles (b) nonpaper, sheet-like articles (e.g., glass sheets) which are not temporarily bent or flexed during their handling, and (c) packets of similar sheets of paper when the thickness of packet or folded sheet varies (e.g., wedge shaped) and this variation is utilized during the stacking or unstacking operation; and:

(3) Note. Class 414 also provides for the stacking of paper sheets or sheet-like articles otherwise proper for Class 271 (i.e., 1a, 1b, and 1c of this note) when the stack formed is subsequently handled as a unit and moved away from the location where it was formed by handling means other than an endless conveyor surface on which the stack was formed. All original patents within the scope of this project have been placed in compliance with this line. However, the patents currently found in Class 271 have not been checked for compliance with this line and will be screened at a later date.

SEE OR SEARCH THIS CLASS, SUBCLASS:

801, for a process of moving intersupporting articles into, within, or from freestanding, orderly layered, or mutually stabilizing orderly group.

SEE OR SEARCH CLASS:

53, Package Making, appropriate subclasses for an apparatus utilizing plural feeding operations to form a group of articles subsequently placed as a unit in a final package.

83, Cutting, subclasses 84+ for apparatus which cuts articles and then forms groups of the cut articles.

209, Classifying, Separating, and Assorting Solids, appropriate subclasses for apparatus for sorting articles according to the physical properties of each particular article and not the number of articles.

221, Article Dispensing, appropriate subclasses, for means to either place an article in a stack from which it is later dispensed by other means or dispense an article from a stack within the scope of the class (See (5) Note of this subclass for line).

GLOSSARY

Repetitive terms used in the titles or definitions of this subclass and its indented subclasses in a special or limited sense are set forth below with the meaning each is to have. For economy of space, an asterisk (*) following a word located in the definition or notes indicates that reference should be made to this Glossary for the specific meaning thereof.

LAYER*

A series of equal (i.e., coplanar) articles having their bases located in a plane which extends across a stack* in a horizontal direction relative to the support surface of the stack*.

LEVEL*

An article within a single article wide stack* or a tier* having its base located entirely within a plane which extends in a horizontal direction relative to the support surface of the stack* or tier*.

STACK*

A freestanding or orderly assemblage of superposed or imbricated articles.

TIER*

A column of articles, a single article wide, located within a wider stack* and extending in a vertical direction relative to the support surface of the stack*.

788.1 Stack forming apparatus:
This subclass is indented under subclass 788. Apparatus which constructs a stack* by placing one article above or below another in contacting relationship.

(1) Note. Apparatus which first places articles into a horizontally extending series and then tilts the series as a unit to form a vertically extending stack* or tier* is considered proper for this and the indented subclasses, since the articles are placed into an assemblage and do intersupport each other for a portion of the time they are together. The mere tilting of an article series into a stack* is not considered proper for this area and is found in 414-754+, since the assemblage is only reoriented and not constructed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
802, for a process of stacking.

788.2 Stacking tapered or nestable articles:
This subclass is indented under subclass 788.1. Apparatus wherein each article placed within the stack* by the apparatus has either (a) one end smaller in size than the opposite end thereof or (b) a shape allowing it to interfit within another article of the stack*.

SEE OR SEARCH THIS CLASS, SUBCLASS:
798.4, for tapered or nestable articles in a horizontally extending series.

SEE OR SEARCH CLASS:
53, Package Making, subclasses 142+ for apparatus for packaging tapered or headed articles.

788.3 And varying orientation of tapered articles in stack:
This subclass is indented under subclass 788.2. Apparatus wherein the smaller end of articles having a large opposite end is placed by the apparatus on at least two different sides of the stack*.

(1) Note. Included within this subclass are (a) a stack* in which two adjacent tapered articles have their smaller ends on opposite sides of the stack* and (b) a stack* in which one group of adjacent tapered articles have their smaller ends on one side of the stack* and another group of adjacent tapered articles have their smaller ends on the opposite side of the stack*.

788.4 Takes articles for stack from another group:
This subclass is indented under subclass 788.1. Apparatus wherein articles placed into the stack* by the apparatus are first removed by it either individually or in small numbers (i.e., less than a complete group) from another distinct assemblage of articles (e.g., stack*).

(1) Note. For the purposes of this and the indented subclasses an article separator inserted within a stack* of articles or a pallet for supporting a stack* of articles is not considered to be one of the stacked articles, unless the stack* is entirely composed of separators and pallets. See subclasses 789.5 and 927 for patents which remove a pallet or separator from a group and place them within a stack* of articles.

SEE OR SEARCH THIS CLASS, SUBCLASS:
791, for placing one stack* upon another.
795.4+, for apparatus for unstacking articles.

788.5 And turns article about horizontal axis:
This subclass is indented under subclass 788.4. Apparatus which revolves at least one of the articles moving from the assemblage into the stack* around a horizontal axis prior to placing it into superposed abutment with another article in the stack*.

788.6 And turns plural articles as a unit about vertical axis:
This subclass is indented under subclass 788.4. Apparatus which revolves two or more articles removed together from the assemblage around a vertical axis prior to placing them together into superposed abutment with other articles of the stack*.

788.7 And transports articles through working, treating, or inspecting station located therebetween:
This subclass is indented under subclass 788.4. Apparatus which also moves at least some of the articles to, within, past, or out of separate means situated along the path taken by these articles when traveling between the assemblage and the stack*, the means being intended to either (a) examine the articles or (b) change them by a chemical process, mechanical force, or physical action.

(1) Note. Patents which claim more than a mere nominal recitation of the means are classified elsewhere on the basis of the structure of the working, treating, or inspection means.

788.8 Including separate unstacking means:
This subclass is indented under subclass 788.1. Apparatus including means distinct from that forming the stack* which removes at least one article from the stack* after or while it is being constructed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
795.4, for apparatus for unstacking articles.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 347.1 for temporary storage of articles on a conveyor system.
221, Article Dispensing, subclasses 10+ and 174+ for forming a stack as a supply source for a subsequent dispensing operation.
271, Sheet Feeding or Delivering, subclasses 3.02+ for forming a stack of sheets and feeding therefrom.

788.9 With means vertically aligning stack being formed:
This subclass is indented under subclass 788.1. Apparatus combined with means located at the site where the stack* is constructed for maintaining or adjusting the vertical alignment of the articles being stacked.

(1) Note. Included within this subclass are means for keeping a vertically extending stack* from tipping over as it is being formed.

(2) Note. This subclass does not include stack* aligning means which are merely named and not defined structurally (e.g., a “magazine”, “holder”).

789 And acting as discharge gate:
This subclass is indented under subclass 788.9. Apparatus wherein the aligning means does not allow the stack* to be discharged from the site until it is shifted from its article aligning position which blocks the path along which the stack* is discharged to another position.

789.1 Powered means (e.g., jogger, etc.):
This subclass is indented under subclass 788.9. Apparatus wherein the article aligning means is power-driven.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, subclasses 221+ for joggers.

789.2 Forms layered stack or row and then upends it:
This subclass is indented under subclass 788.1. Apparatus which (A) either (a) constructs a stack* having plural layers* or (b) places plural articles into abutment with each other to con-

struct one or more horizontal extending, single article wide, linear series and (B) thereafter tilts the previously constructed stack* or series about a horizontal axis to place it upon one of its ends and thus reorient or create a stack*.

SEE OR SEARCH THIS CLASS, SUBCLASS:

469+, for a self-loading or unloading vehicle having a pivotable load receiving portion.

754+, for article or stack* reorienting devices, per se.

789.3 Tiers or layers formed and sequentially added to stack prior to upending:

This subclass is indented under subclass 789.2. Apparatus wherein the layered stack* is constructed by first placing within either a tier* or layer* all articles going therein and then moving each newly formed tier* or layer* as a unit into abutment respectively with another entire tier* or layer* until the stack* is finished and subsequently tilted.

789.4 Includes means for crossing articles in layer:

This subclass is indented under subclass 789.3. Apparatus including means which places two or more articles into at least one layer* of the completed layered stack* with their longest horizontally extending sides at an angle to each other.

789.5 Inserts separator into stack:

This subclass is indented under subclass 788.1. Apparatus wherein at least one of the "articles" placed within the stack* is (a) different from other articles in the stack* and (b) manufactured for the purpose of separating or supporting articles within a stack*.

789.6 Plural article sources:

This subclass is indented under subclass 788.1. Apparatus wherein the stack* is constructed by the apparatus from articles supplied from different locations.

789.7 Includes means on or linked with transporting vehicle for forming and discharging stack:

This subclass is indented under subclass 788.1. Apparatus including means mounted on or structurally connected to an article carrying vehicle which both places articles in a stack* and discharges the stack* from the vehicle.

(1) Note. The means proper for this subclass may include discrete means for accomplishing each function (i.e., stacking means and discharge means).

SEE OR SEARCH THIS CLASS, SUBCLASS:

24.5+, for stacked round Hay bales.

111, for bale accumulators in which the bales are placed in a horizontally extending series and are not superposed.

467+, for a self-loading or unloading vehicle, and particularly subclasses 497 and 509+ for specific kinds of load ejecting devices.

789.2, for forming the groups on that type of bale accumulators.

SEE OR SEARCH CLASS:

56, Harvesters, subclasses 474+ for discharging carriers in combination with harvesters.

789.8 Creates single stack by juxtaposing separately formed tiers:

This subclass is indented under subclass 788.1. Apparatus which constructs a multi-tier stack* by either (a) successively constructing plural, fully completed, discrete tiers* in abutment with each other or (b) placing plural, fully complete, discrete tiers* which have been already formed by it in abutment with each other.

SEE OR SEARCH THIS CLASS, SUBCLASS:

791.6+, for an apparatus which builds a multi-tier stack* by placing articles side by side in one layer* of the stack* and then placing articles in a second layer* of the stack* so that the articles in the two layers* form vertical rows.

789.9 With means for removing completed stack from stacking location:

This subclass is indented under subclass 788.1. Apparatus combined with means for discharging the stack* from the site where it is constructed, the stack* being in its final configuration and maximum height and not

intended to form layers* or levels* of a larger stack*.

SEE OR SEARCH THIS CLASS, SUBCLASS:

791, for apparatus which forms a stack at one location and thereafter places this stack* in a larger stack* at another location.

790 Interfingers with stack support moving vertically relative to removing means:
This subclass is indented under subclass 789.9. Apparatus wherein a stack* supporting structure which forms part of the apparatus or site interdigitates with the discharge means or an article support on the discharge means to transfer the stack* therebetween when the means and supporting structure move vertically relative to each other during the stack* discharging operation (e.g., a stack supporting platform movable downwardly between rollers, stack* supporting tines movable downwardly on opposite sides of an endless belt conveyor).

790.1 Articles received and stack discharged at interfingering location:
This subclass is indented under subclass 790. Apparatus in which the stack* supporting structure acquires the articles which form the stack* at the same location where the stack* is transferred from the supporting structure onto the discharge means.

790.2 Includes stack gripping device:
This subclass is indented under subclass 789.9. Apparatus wherein the discharging means includes a device to engage the stack* and exert a holding force thereon which prevents, or tends to prevent, either (a) the stack* from shifting relative to the device or (b) the articles within the stack* from shifting relative to each other while the stack* is being discharged from the site.

790.3 Pusher:
This subclass is indented under subclass 789.9. Apparatus in which the discharge means exerts a generally horizontally directed force against the stack while the stack* is on a separate support at the site to push it therefrom.

(1) Note. Included here is a pusher which moves an unload pallet against a pallet on which a stack has been formed, thereby moving the loaded pallet from the site and moving the unloaded pallet into the site.

790.4 Includes carrier having distinct supports each successively receiving a stack thereon:
This subclass is indented under subclass 789.9. Apparatus wherein the discharge means includes a plurality of separate stack* supports positioned on or linked to a common transporting device (e.g., powered conveyor, vehicle) which sequentially registers each support with the site where the stacks* are constructed and removes it from the site after a stack* is either placed on or constructed upon the support.

790.5 Includes gravity unloaded movable support:
This subclass is indented under subclass 789.9. Apparatus wherein the discharge means includes structure located at the site where the stack* is constructed with (a) supports the stack* against gravity when in the position it receives the stack* and (b) then shifts to another position (e.g., retracts, tilts) to cause the stack to fall therefrom.

790.6 And conveyor for receiving unloaded stack:
This subclass is indented under subclass 790.5. Apparatus wherein the discharge means also includes a power driven conveyor or a gravity conveyor which receives the stack* after it has fallen from the support and transports its.

790.7 Includes driven conveyor whereon continuously supported stack is formed:
This subclass is indented under subclass 789.9. Apparatus wherein the discharge means includes a power driven conveyor which engages and constantly supports the stack* during its construction and discharges it from the site thereafter.

790.8 With temporary support for incoming articles during discharge of stack:
This subclass is indented under subclass 789.9. Apparatus combined with means at the stack* forming site which (a) operates in conjunction with the stack* discharge means, (b) periodically interrupts the flow of and supports articles newly arriving at the site during the short time needed by the discharge means to remove a finished stack* from a primary support where it is formed, and (c) releases its held articles

and allows normal article flow to the site's primary stack* support after discharge of the finished stack*.

SEE OR SEARCH CLASS:
271, Sheet Feed or Delivering, subclass 218 for an auxiliary support for part of a stack of sheets.

790.9 Stacks articles on different supports:
This subclass is indented under subclass 788.1. Apparatus which forms distinct stacks* upon two or more stack* supporting structures.

791 And combines into single stack:
This subclass is indented under subclass 790.9. Apparatus which also moves one of the distinct stacks* from its original supporting structure and places it above or below another distinct stack* to form a larger stack*.

791.1 Includes conveyor for feeding articles to sequentially formed stacks:
This subclass is indented under subclass 790.9. Apparatus including a power driven or gravity conveyor which (a) supplies a stream of articles to each stack* supporting structure and (2) constructs a completed stack on one supporting structure prior to redirecting its flow to the next supporting structure.

791.2 Offsets or crosses adjacent articles in single article wide stack:
This subclass is indented under subclass 788.1. Apparatus which constructs a single article wide stack* and places at least two articles into contacting levels* of the stack* with either (a) their geometrical centers horizontally spaced from each other or (b) their longest horizontal dimensions at an angle to each other.

SEE OR SEARCH THIS CLASS, SUBCLASS:
792, for offset or crossed layers* of a stack*.

791.3 Articles inverted in adjacent levels or layers:
This subclass is indented under subclass 788.1. Apparatus which places at least two similar contacting articles with reversed vertical orientations relative to each other (i.e., one is turned upside down relative to the other) into different levels* or layers* of the stack*.

791.4 Layers:
This subclass is indented under subclass 791.3. Apparatus wherein the articles are placed in layers*.

791.5 Formed with sloped or stepped side:
This subclass is indented under subclass 788.1. Apparatus in which the stack* constructed has one vertically extending external surface which is either (a) inclined (i.e., at an oblique angle) relative to the stack* supporting structure or (b) stairlike in shape.

791.6 Sequentially forms or adds completed layers:
This subclass is indented under subclass 788.1. Apparatus which constructs a layered stack* by either (a) placing within a layer* all of its articles and then constructing another layer* in a similar manner above or below it and in contact therewith or (b) moving an entire layer* into superposed abutment with another entire layer*.

791.7 Offsets circular articles within adjacent rows of layer:
This subclass is indented under subclass 791.6. Apparatus wherein the articles are (a) spherical or cylindrical in shape and (b) placed in one of two distinct parallel rows within the layer in such a manner that the geometrical centers of all contacting articles within the rows are spaced from each other longitudinally along the length of the rows (i.e., the curved periphery of an article located in one row contacts the curved peripheries of two articles in the parallel row).

791.8 Leaves void between articles in layer:
This subclass is indented under subclass 791.6. Apparatus wherein two or more the articles placed within at least one layer* of the stack* have a gap or empty space left therebetween.

791.9 To facilitate insertion of handling means:
This subclass is indented under subclass 791.8. Apparatus wherein the gap or space is provided to permit the insertion of stack* engaging means into the layer*.

792 Crosses articles in adjacent layers:
This subclass is indented under subclass 791.6. Apparatus which places at least two contacting articles into distinct layers* of the stack* with their longest horizontally extending sides at an angle to each other.

792.1 Includes swingable pusher for turning article shoved to layer:
This subclass is indented under subclass 792. Apparatus including a pivoting arm which both (a) contacts and pushes an article across a support and (b) changes the orientation of the longest extending side of the article relative to the stack* while the article is moved towards or placed into its layer*.

792.2 With rotating stack support:
This subclass is indented under subclass 792. Apparatus combined with structure for supporting the stack* which turns about a vertical axis.

792.3 Rotated between addition of completed layers:
This subclass is indented under subclass 792.2. Apparatus wherein the supporting structure is turned prior to each entire layer* being moved as a unit into superposed abutment with another previously supported layer* of the stack*.

792.4 Turns completed layer about vertical axis before stacking:
This subclass is indented under subclass 792. Apparatus which reorients relative to the stack* the longest horizontally extending side of all articles within a layer* by revolving the entire layer as a unit about a vertical axis prior to placing it in superposed abutment with another layer* of the stack*.

792.5 Offsets articles within parallel adjacent superposed rows:
This subclass is indented under subclass 791.6. Apparatus wherein some of the articles of the stack* are placed (A) within two parallel rows which (a) are positioned in different layers* of the stack*, (b) have coextensive widths, and (c) share a common border with each other, and (B) in such a manner that all contacting articles within the two rows have their geometrical centers spaced from each other longitudinally along the length of the rows.

792.6 Adds rows of articles to layer:
This subclass is indented under subclass 791.6. Apparatus which constructs a layer* of the stack* by placing at least two previously formed horizontally extending, linear series of articles into abutment with each other.

792.7 Positions lowest article of stack first:
This subclass is indented under subclass 788.1. Apparatus wherein the initial article placed within the stack* being constructed is the article which will be located at the bottom thereof and upon which all other subsequent articles are supported as the height of the stack* is increased.

(1) Note. A stack which consist solely of imbricated (i.e., lapped) articles having their lowest portion with a common plane is excluded from this and the indented subclasses, since the height of the stack* is not increased by the addition of articles thereto.

792.8 Includes horizontally shiftable, article elevating device:
This subclass is indented under subclass 792.7. Apparatus including a device which (a) moves as a unit in a horizontal direction to the stacking site from another location and (b) raises or lowers article supporting structure forming a component thereof vertically when placing an article onto the top of the stack*.

(1) Note. To be proper for this and the indented subclass the horizontal distance traveled by the elevating device (e.g., traversing hoist) must be longer than the mere width of the stack*.

SEE OR SEARCH THIS CLASS, SUBCLASS:
793.8, and 794.1, for a vertically moving article support which shifts horizontally the width of its stack*.

792.9 With article gripping means:
This subclass is indented under subclass 792.8. Apparatus in which the device is provided with means for engaging an article to be stacked and exerting a holding force thereon which pre-

vents, or tends to prevent, the article from shifting relative to the means while the article is moved by the device to the stacking site.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, appropriate subclasses for specific article gripping means.

793 Includes suction-type article gripping means:
This subclass is indented under subclass 792.7. Apparatus including means for exerting a holding force on an article to be stacked, wherein the force (a) is at least partially derived by reducing the air pressure over a surface of the article below the ambient pressure on the other surfaces of the article and (b) prevents, or tends to prevent, the article from shifting relative to the portion of the apparatus contacting the article while it is moved to the stacking site.

SEE OR SEARCH THIS CLASS, SUBCLASS:
627, for a suction gripper mounted on an elevator or hoist.
737, for a suction or magnetic gripper mounted on a vertically swinging load support.
744.1, for a suction gripper mounted on a horizontally swinging load support.
752.1, for a suction gripper means mounted for horizontal linear movement.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclasses 64.1+ for implements adapted to employ the use of a vacuum.
901, Robots, subclass 40 for an end effector utilizing a vacuum.

793.1 And endless belt for transporting:
This subclass is indented under subclass 793. Apparatus which also includes a flaccid strap (e.g., belt, chain) having its ends interconnected and traveling around a path defined by guiding and driving structure therefor, and wherein the means for exerting the article holding force either (a) directly engages the article and is mounted to the strap which moves both it and the article to the stacking site or (b) exerts its force through the strap and causes the article to be held thereon while the strap moves it to the stacking location.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 689.1 for a conveyor of that class having load adhering or friction enhancing means of a suction type.

793.2 Includes magnetic-type article gripping means:
This subclass is indented under subclass 792.7. Apparatus including means for exerting a holding force on an article to be stacked, wherein the force (a) is at least partially derived from a magnetic attraction between the article and a component of the means and (b) prevents, or tends to prevent, the article from shifting relative to the portion of the apparatus contacting the article while it is moved to the site.

SEE OR SEARCH THIS CLASS, SUBCLASS:
606, for magnet and grip mounted on an elevator or hoist.
737, for a suction or magnetic gripper mounted on a vertically swinging load support.
744.1, for a magnetic gripper mounted on a horizontally swinging load support.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, subclass 65.5 for implements adapted to employ magnetic means.
901, Robots, subclass 40 for an end effector utilizing magnetic force.

793.3 And endless belt for transporting:
This subclass is indented under subclass 793.2. Apparatus which also includes a flaccid strap (e.g., belt, chain) having its ends interconnected and traveling around a path defined by guiding and driving structure therefor, and wherein the means for exerting the article holding force either (a) directly engages the article and is mounted to the strap which moves both it and the article to the stacking site or (b) exerts its force through the strap and causes the article to be held thereon while the strap moves it to the stacking location.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclass 690.1 for a conveyor of that class having load adhering or friction enhancing means of a magnetic type.

793.4 Includes support vertically alignable with stack then shiftable from beneath article:

This subclass is indented under subclass 792.7. Apparatus including an underlying support for an article to be stacked which is movable from (a) a first position where it is located underneath the article and directly over the stacking site to (b) a second position located out from underneath the article and not over the stacking site, wherein the article is added to the stack when the support moves to its second position.

SEE OR SEARCH CLASS:

271, Sheet Feeding or Delivering, subclasses 189+ for means temporarily interposed between a conveyor and receiver.

793.5 Support carried or formed by endless belt conveyor:

This subclass is indented under subclass 793.4. Apparatus in which the support is attached to or consist of a flaccid strap (e.g., belt, chain) having its end interconnected and traveling around a path defined by rotatable strap guiding or driving structure, wherein the support attached thereto or consisting thereof engages the article and travels with it around a portion of the strap's path when the article is added to the stack.

793.6 With belt and article moving vertically together above discharge:

This subclass is indented under subclass 793.5. Apparatus in which the strap moved support and the article to be stacked travel together along a generally vertical portion of the strap's path located immediately above the point on the path where the article leaves the support.

793.7 And additional noncoaxial endless belt coacting therewith to support article above discharge:

This subclass is indented under subclass 793.6. Apparatus including another flaccid strap having its ends also interconnected which (a) travels around a different path defined by strap guiding or driving structure rotating around axes which are not colinear with those about which the other strap's guiding or driving structure rotate, (b) has an article support attached to or formed thereby which travels with the article along a generally vertical portion of the strap's path located immediately above the point where the article leaves the support and (c) jointly supports with the other strap the article to be stacked for a portion of the time the article is moved vertically towards the stack* or stacking site.

793.8 Support adjusts vertically as height of stack increases:

This subclass is indented under subclass 793.4. Apparatus wherein the movable support is mounted in a manner that allows it to move as a unit in a vertical direction to compensate for changes in the size of the stack* as articles are added thereto.

793.9 Support revolves around central axis during shifting and return:

This subclass is indented under subclass 793.4. Apparatus wherein the support turns completely around a central axis and follows a circular path when moving back and forth between its first and second positions.

794 Support swings during shifting and return:

This subclass is indented under subclass 793.4. Apparatus wherein the support is pivotally mounted and pivots back and forth when moving between its first and second positions.

794.1 Support travels vertically spaced paths during shifting and return:

This subclass is indented under subclass 793.4. Apparatus wherein the support moves along a horizontal extending path when going from the second to the first position with the article, moves vertically, and then goes along another distinct horizontally extending path after discharging the article and returning back to the second position.

794.2 Plural coacting supports shifting in opposite directions:

This subclass is indented under subclass 793.4. Apparatus wherein at least two supports simultaneously contact the article prior to its addition to the stack* and move in directions

opposed to each other when going to or from their first and second positions.

794.3 And movable stop engaging article during shifting of support:
This subclass is indented under subclass 793.4. Apparatus also including a movable device which contacts and blocks the path of the article to prevent it from traveling with the supporting structure as it moves between positions.

794.4 Includes endless belt for delivering:
This subclass is indented under subclass 792.7. Apparatus including a flaccid strap (e.g., belt, chain) having its ends interconnected which (a) travels around a path defined by rotatable strap guiding or driving structure and (b) has article supporting structure attached to or formed thereby which engages an article to be stacked and travels around a portion of the strap's path with this article while moving it onto the stacking site or stack*.

794.5 Having discharge vertically shiftable:
This subclass is indented under subclass 794.4. Apparatus having the guiding or driving structure defining the portion of the strap's path where the article to be stacked leaves its supporting structure mounted in a manner allowing it to move vertically when the height of the stack* is increased.

794.6 Having discharge vertically shiftable as stack grows:
This subclass is indented under subclass 792.7. Apparatus having the portion of the apparatus which last engages the article prior to its placement on the stack* or stacking site mounted in a manner allowing it to move vertically when the height of the stack* is increased.

794.7 Includes pusher conveyor for delivering:
This subclass is indented under subclass 792.7. Apparatus including means which contacts and exerts a generally horizontally directed force against an end of the article to be stacked and shoves it across a separate supporting surface and onto the stack* or stacking site.

794.8 Includes roller conveyor for delivering:
This subclass is indented under subclass 792.7. Apparatus including a rotatable element (e.g., wheel) having a perimeter which engages the article to be stacked while the element is rotating about its axis to either (a) transmit a driving force frictionally to or (b) reduce the friction on one of the surfaces of the article when it is moving towards and onto the stack* or stacking site.

794.9 Positions highest article of stack first:
This subclass is indented under subclass 788.1. Apparatus wherein the initial article placed within the stack* being constructed is the article which will be located at the top thereof and supported upon all other subsequently position articles as the height of the stack* is increased.

(1) Note. A stack* which consist solely of imbricated (i.e., lapped) articles having their lowest portion within a common plane is excluded from this and the indented subclasses, since the height of the stack* is not increased by the addition of articles thereto.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, subclass 212 for a pack of sheets stacked from below.

795 Includes rotary deliverer:
This subclass is indented under subclass 794.9. Apparatus including a rotatable element (e.g., wheel) having a perimeter which engages the article to be stacked while the element is rotating about its axis to either (a) transmit a driving force frictionally to or (b) reduce the friction on one of the surfaces of the article when it is moving towards and into the stack* or onto the stacking site.

795.1 Coacting screws:
This subclass is indented under subclass 795. Apparatus wherein there are two rotary elements which (a) each have an article engaging perimeter with a helical shape and (b) jointly support the article to be stacked as it moves toward the stack* or stacking site.

795.2 Includes means for raising highest article and lowering it upon newly delivered article:
This subclass is indented under subclass 794.9. Apparatus including means which (a) elevates the initially placed article and all additional articles already within the stack* above the site

while another component of the apparatus delivers an article to the stacking site and (b) places (e.g., drops) the elevated article(s) onto the newly delivered article.

795.3 Includes means raising article up to stack:
This subclass is indented under subclass 794.9. Apparatus including means which elevates an article and places it either onto the stacking site or against the bottom of the stack*.

795.4 Unstacking apparatus:
This subclass is indented under subclass 788. Apparatus which reduces the size or height of a stack* by taking one or more articles from above or below another article in the stack*.

(1) Note. Apparatus which first tilts a stack* or tier* as a unit to "construct" a horizontally extending series and then removes articles from the series is considered proper for this and the indented subclasses, since the articles are removed from an assemblage and do intersupport each other for a portion of the time they are together. The mere tilting of a stack* into a horizontally extending series is not considered proper for this area and is found in 414-754+, since the assemblage is only reoriented and not demolished by the removal of articles therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:
788.8, for a apparatus which both stacks and unstacks articles.

SEE OR SEARCH CLASS:
221, Article Dispensing, appropriate subclasses for various means for dispensing articles from a stack.
271, Sheet Feeding or Delivering, subclass 280 for separating a sheet from a moving assemblage of sheets.

795.5 Utilizes fluid blast to remove article:
This subclass is indented under subclass 795.4. Apparatus which directs a gust or stream of fluid generated by it upon a surface of at least one article of the stack* to take it therefrom.

795.6 Unstacking tapered or nestable articles:
This subclass is indented under subclass 795.4. Apparatus wherein each article taken from the stack* by the apparatus has either (a) one end smaller in size than the opposite end thereof or (b) a shape allowing it to interfit within another article of the stack*.

795.7 With means vertically aligning stack:
This subclass is indented under subclass 795.4. Apparatus combined with means located at the site where the stack* is reduced for maintaining or adjusting the vertical alignment of the articles in the stack* prior to or during the period an article is taken therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:
788.9, for means to align a stack* in a stacking operation.

795.8 With means replacing depleted stack:
This subclass is indented under subclass 795.4. Apparatus combined with means successively charging new stacks onto the site where they are to be reduced in size by the apparatus, each stack* being charged only when the stack* previously on the site has been completely reduced.

795.9 Removes complete tier from multi-tier stack:
This subclass is indented under subclass 795.4. Apparatus which reduces a multi-tier stack* by first successively taking discrete entire tiers* from the stack and then reducing each tier* by taking articles from it.

796 Separates stack into smaller stacks:
This subclass is indented under subclass 795.4. Apparatus which reduces the size of a large stack* by taking at least one smaller stack* of articles from it.

796.1 Removes smaller stack from bottom:
This subclass is indented under subclass 796. Apparatus which takes at least one smaller stack* from beneath the article left in the remainder of the larger stack* upon which all other articles therein are supported.

796.2 Removes layer as unit:
This subclass is indented under subclass 795.4. Apparatus which takes as a single entity an entire layer* of articles from a layered stack*.

796.3 And changes position or orientation of articles within layer:
This subclass is indented under subclass 796.2. Apparatus which also either (a) varies the spacing between at least two of the articles or (b) alters the attitude of at least two of the articles relative to each other while the articles are still grouped together in a layer*.

796.4 With means for reorienting article after unstacking:
This subclass is indented under subclass 795.4. Apparatus combined with means which contacts at least one article taken from the stack* to change the attitude thereof relative to a portion of the apparatus which supports the article during its removal.

796.5 Removes highest article first from stack:
This subclass is indented under subclass 795.4. Apparatus which reduces the height of the stack* by initially taking the uppermost article from the remaining portion of the stack*.

(1) Note. A stack which consist solely of imbricated (i.e., lapped) articles having their lowest portion within a common plane is excluded from this and the indented subclasses, since the height of the stack* is not reduced by the removal of an article therefrom.

796.6 With means offsetting highest article prior to removal:
This subclass is indented under subclass 796.5. Apparatus combined with means for horizontally displacing the uppermost article of the stack* from its normal position in the stack* to a new position which is still in contact with the adjacent article of the stack* before the apparatus takes it therefrom.

796.7 With stack elevating means:
This subclass is indented under subclass 796.5. Apparatus combined with means which supports and raises the stack* vertically towards the location where the uppermost article is taken from the stack*.

796.8 Pusher separates article from stack after elevation:
This subclass is indented under subclass 796.7. Apparatus including means which contacts and exerts a horizontally directed force against an end of the uppermost article and shoves it completely off of the contacting supporting surface of the adjacent article of the stack* after the stack* has been raised.

796.9 Includes article gripping device:
This subclass is indented under subclass 796.5. Apparatus including a device to engage the uppermost article and exert a holding force thereon which prevents, or tends to prevent, the article from shifting relative to the device while the article is being taken from the stack*.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, appropriate subclasses for specific article gripping means.

797 By suction:
This subclass is indented under subclass 796.9. Apparatus wherein at least a portion of the holding force is derived by reducing the air pressure over a surface of the article below the ambient pressure on other surface of the article.

SEE OR SEARCH THIS CLASS, SUBCLASS:
627, for a suction gripper mounted on an elevator or hoist.
737, for a suction or magnetic gripper mounted on a vertically swinging load support.
744.1, for a suction gripper mounted on a horizontally swinging load support.
752.1, for a suction gripper mounted for horizontal linear movement.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 689.1 for a conveyor of that class having load adhering or friction enhancing means of a suction type.
294, Handling: Hand and Hoist-Line Implements, subclasses 64.1+ for implements adapted to employ the use of a vacuum.
901, Robots, subclass 40 for an end effector utilizing a vacuum.

797.1 By magnetic force:
This subclass is indented under subclass 796.9. Apparatus wherein at least a portion of the holding force is derived from a magnetic attraction between the uppermost article and a component of the device.

SEE OR SEARCH THIS CLASS, SUBCLASS:
606, for magnet and grab mounted on an elevator or hoist.
737, for a suction or magnetic gripper mounted on a vertically swinging load support.
744.1, for a magnetic gripper mounted on a horizontally swinging load support.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 690.1 for a conveyor of that class having load adhering or friction enhancing means of a magnetic type.
294, Handling: Hand and Hoist-Line Implements, subclass 65.5 for implements adapted to employ magnetic means.
901, Robots, subclass 40 for an end effector utilizing magnetic force.

797.2 Includes endless belt article separator:
This subclass is indented under subclass 796.5. Apparatus including a flaccid strap (e.g., belt, chain) having its ends interconnected which (a) travels around a path defined by strap guiding and driving structure and (b) has article engaging structure attached to or formed thereby which engages the uppermost article of the stack* and travels around a portion of the strap's path with this article while taking it away from the remainder of the stack* or site.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, subclasses 34+ for an endless belt separator which removes flexible sheet items from a stack*.

797.3 Includes rotary article separator:
This subclass is indented under subclass 796.5. Apparatus including a rotatable element (e.g., wheel) which (a) is driven around its central axis by a power source and (b) has a perimeter which engages the uppermost article of the stack* while the element is rotating about its axis to frictionally transmit the driving force directly to one of the surfaces of the article and take it from the remainder of the stack*.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, subclasses 109+ for a rotary separator which removes flexible sheet items from a stack*.

797.4 Removes lowest article first from stack:
This subclass is indented under subclass 795.4. Apparatus which reduces the height of the stack* by initially taking the lowermost article from the remaining portion of the stack*.

(1) Note. A stack* which consist solely of imbricated (i.e., lapped) articles having their lowest portion within a common plane is excluded from this and the indented subclasses, since the height of the stack* is not reduced by the removal of an article therefrom.

797.5 Includes means for elevating remainder of stack therefrom:
This subclass is indented under subclass 797.4. Apparatus including means which supports and vertically raises the two or more articles in the stack* initially positioned above and supported on top of the lowermost article of the stack* thus separating or “taking” it from the stack*.

797.6 Includes endless belt article separator:
This subclass is indented under subclass 797.4. Apparatus including a flaccid strap (e.g., belt, chain) having its ends interconnected which both (a) travels around a path defined by strap guiding and driving structure and (b) has article contacting structure attached to or formed thereby which engages the lowermost article of the stack* and travels around a portion of the strap's path with this article while moving it away from the remainder of the stack* or site.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, subclasses 34+ for an endless belt separator which removes flexible sheet items from a stack*.

797.7 Includes rotary article separator:
This subclass is indented under subclass 797.4. Apparatus including a rotatable element (e.g., wheel) which (a) is driven around its central axis by a power source and (b) has a surface which engages the lowermost article of the stack* while the element is rotating about its axis to transmit the driving force directly to one of the surfaces of the article and carry it from the remainder of the stack*.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, subclasses 109+ for a rotary separator which removes flexible sheet items from a stack*.

797.8 Includes article separator with gripping device:
This subclass is indented under subclass 797.4. Apparatus including means which exerts a force on the lowermost article of the stack* directly through an interconnected device which moves therewith, the device exerting a holding force on the article which prevents, or tends to prevent, the article from shifting relative to the device while it is being taken by the means from the stack*.

SEE OR SEARCH CLASS:
294, Handling: Hand and Hoist-Line Implements, appropriate subclasses for specific means for gripping articles.

797.9 Includes pusher article separator:
This subclass is indented under subclass 797.4. Apparatus including means which contacts and exerts a horizontally directed force against an end of the lowermost article of the stack* and shoves it across, and out of contact with, both the stack* supporting surface and the contacting surface of the adjacent article.

798 Includes movable stack support for gravity unloading article:
This subclass is indented under subclass 797.4. Apparatus including structure which supports the stack* against gravity when in the position it receives the stack* and then shifts to another position (e.g., retracts, tilts) to cause the lowermost article of the stack* to fall under the influence of gravity and be taken from the remainder of the stack*.

798.1 And means for temporarily holding remainder of stack:
This subclass is indented under subclass 798. Apparatus also including means operating in conjunction with the stack* supporting structure for periodically holding the articles in the stack* which are located above the lowermost article during the short time period needed by the supporting structure to shift from, and return to, its initial stack* supporting position.

798.2 Positions intersupporting article into row:
This subclass is indented under subclass 788. Apparatus which places one or more of the sustained or sustaining articles into a single article wide assemblage which extends in a generally horizontal direction.

798.3 Takes article therefor from another spaced group:
This subclass is indented under subclass 798.2. Apparatus wherein at least one article placed within the single article wide assemblage by the apparatus is first removed by it either individually or with a small number of other articles from a second article assemblage which is not in contact with the first assemblage.

798.4 Tapered or nestable articles positioned:
This subclass is indented under subclass 798.2. Apparatus wherein each article placed has either (a) one end smaller in size than the opposite end thereof or (b) a shape allowing it to fit within or over a portion of another similar article.

SEE OR SEARCH CLASS:
53, Package Making, subclasses 142+ for apparatus for packaging tapered or headed articles.

798.5 Includes revolving or swinging handler:
This subclass is indented under subclass 798.3. Apparatus including an element which either (a) turns completely around a central axis or (b) pivots back and forth about a pivotal axis and applies a force to, or reduces friction on, one of the surfaces of the article when it is moving towards the single article wide assemblage.

798.6 And pusher conveyor for delivering:
This subclass is indented under subclass 798.5. Apparatus including means which (a) receives an article directly or indirectly from the turning or pivoting element and (b) contacts and exerts a generally horizontally directed force against an end of the article to shove it across a separate supporting surface and into the single article wide assemblage.

798.7 Includes pusher conveyor for delivering:
This subclass is indented under subclass 798.2. Apparatus including means which contacts and exerts a generally horizontally directed force against an end of the article to shove it across a separate supporting surface and directly into the single article wide assemblage.

798.8 Includes nonpowered guide for delivering:
This subclass is indented under subclass 798.2. Apparatus including structure (e.g., tube, trough) which directs the article as it is moved by gravitational force, or force exerted on it by another portion of the apparatus, along a fixed course into the single article wide assemblage.

798.9 Removes intersupporting article from row:
This subclass is indented under subclass 788. Apparatus which takes one or more of the sustained or sustaining articles from a single article wide assemblage which extends in a generally horizontal direction.

SEE OR SEARCH THIS CLASS, SUBCLASS:
746.4, for apparatus including an inclined ramp means for conveying pipe or the like under the influence of gravity and means for removing pipe held against movement while supported by said ramp. The disclosure may include a series of juxtaposed articles supported by the ramp.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, appropriate subclasses for means to remove sheets on edge from a support.

799 APPARATUS FOR POSITIONING PLURAL ORDERLY ARTICLES ONTO PALLET:
This subclass is indented under the class definition. Apparatus for placing two or more articles at specific predetermined locations upon a detached, nonwheeled, portable platform which travels with the articles thereafter to facilitate their additional handling as a unit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
403+, for a device for emptying a portable receptacle in combination with means to place articles thereon.
788.1+, for apparatus which forms a stack* of articles upon a site (e.g., pallet).
798.2+, for apparatus which forms a row of intersupporting articles upon a site (e.g., pallet).

800 PROCESS:
This subclass is indented under the class definition. Process of placing or displacing a particular article or material in a particular manner or with reference to a particular support.

801 Of moving intersupporting articles into, within, or from freestanding, orderly layered, or mutually stabilizing orderly group:
This subclass is indented under subclass 800. Process of (a) placing an article in, (b) shifting an article relative to an article within, or (c) removing an article from a particular location in an assemblage of a contacting article formed or taken apart at a site, wherein (1) each article of the assemblage must at least partially sustain, or must be at least partially sustained by, an adjacent article of the assemblage for a portion of the time the articles are in contact with each other, and (2) the complete assemblage is (i) capable of maintaining its shape without support in the horizontal direction on the articles from external confining structure (e.g., receptacle walls, inclined shelf), (ii) transportable as a unit from a site and composed of plural articles located within at least two layers forming the assemblage, or (iii) entirely composed of articles which would each be unsteady or relatively unsteady (i.e., the articles have a more stable attitude), if placed by themselves in the particular predetermined location in which the articles are at least partially held by

the sustaining force exerted thereon by an adjacent article.

SEE OR SEARCH THIS CLASS, SUBCLASS:
788+, for apparatus for moving intersupporting articles into, within, or from freestanding, orderly layered, or mutually stabilizing group.

802 Of stacking:
This subclass is indented under subclass 801. Process of constructing a freestanding or orderly assemblage of superposed or imbricated articles (i.e., stack) by placing one article above or below another article in contacting relationship.

(1) Note. A process which solely "unstacks" an article from a freestanding assemblage of superposed or imbricated articles is not considered proper for placement in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
788.1+, for apparatus for constructing a stack.

803 Of loading or unloading marine system:
This subclass is indented under subclass 800. Process of charging or discharging a buoyant vehicle characterized by some peculiarity due to the fact that the vehicle floats on or in water.

SEE OR SEARCH THIS CLASS, SUBCLASS:
137.1+, for apparatus for loading or unloading a marine system.

804 Of material charging or discharging of a chamber of a type utilized for a heating function:
This subclass is indented under subclass 800. Process of charging or discharging a receptacle-like structure (e.g., furnace, oven, etc.) of a kind adapted to be provided with means for heating the structure and means for moving or enabling gravity movement of either (a) material in the nature of work which is to be heated in the structure or (b) material in the nature of fuel which is to be consumed during a work-heating operation to, adjacent to, into, from, within, etc. the structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
147+, for a chamber of a type utilized for a heating function and material charging or discharging means therefor.

805 Of moving material between zones having different pressures and inhibiting change in pressure gradient therebetween:
This subclass is indented under subclass 800. Process of moving or enabling gravitational movement of material from a region having a particular pressure to a region having another pressure and preventing or significantly retarding any change in the pressure differential between the regions.

SEE OR SEARCH THIS CLASS, SUBCLASS:
217+, for apparatus for moving a material between zones having different pressures and inhibiting change in pressure gradient therebetween.

806 Of charging load-holding or -supporting element from source and transporting element to working, treating, or inspecting station:
This subclass is indented under subclass 800. Process of charging a load-grasping device, load-securing (e.g., impaling, suction, etc.) structure, or load-underlying surface from a source of material supply and means to move the device, structure, or surface to, or translationally align the device, structure, or surface with, a nominal or unspecified work, treatment, or inspection station.

SEE OR SEARCH THIS CLASS, SUBCLASS:
222+, for apparatus for charging a load-holding or -supporting element from a source, and means for transporting the element to a working, treating, or inspecting station.

807 Of charging or discharging plural static structures for supporting discrete loads and utilizing charging or discharging means therefor:
This subclass is indented under subclass 800. Process of moving a charge toward, to, onto, into, from, away from, off of, out of, etc. a plu-

rality of charge-supporting elements or charge-holding receptacles of a fixed or stationary nature and including charging or discharging means therefor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

266+, for apparatus comprising plural static structures for supporting discrete loads and charging or discharging means therefor.

808 Of charging or discharging, or facilitating charging or discharging of static receptacle:

This subclass is indented under subclass 800. Process of moving, or facilitating the movement of, a charge of material to or from a charge-holding receptacle of a fixed or stationary nature (e.g., a bin, silo, tank, etc.) and wherein the purpose of the movement is to charge or discharge the material to or from the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

288+, for apparatus comprising a static receptacle and means for charging or discharging, or facilitating the charging or discharging of, the receptacle.

809 Of loading or unloading load-transporting type vehicle and external means cooperating in loading or unloading thereof:

This subclass is indented under subclass 800. Process of charging or discharging a load-transporting type vehicle having means outside or apart from the vehicle which contributes in some manner with the charging or discharging thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

339, for wheeled, load-transporting type vehicles forming a train, and loading or unloading means therefor, located at least in part thereon.

340+, for wheeled, load-transporting type vehicles and means for transferring, or enabling transfer of, load from one vehicle to another.

349+, for a wheeled, load-transporting type vehicle having driven means thereon for repositioning load-supporting portion of vehicle to cause or facilitate movement of load to or from an external cooperating means.

352+, for a wheeled, load-transporting type vehicle having driven means thereon for engaging and moving load horizontally, or with horizontal component, to or from an external cooperating means.

354+, for a wheeled, load-transporting type vehicle and external means for supporting vehicle in toto and reorienting the vehicle into load-releasing attitude.

373+, for a load-transporting type vehicle and external means cooperating in the loading or unloading thereof.

810 Of emptying portable receptacle:

This subclass is indented under subclass 800. Process of engaging a portable receptacle or container including contents therein and removing the contents from the receptacle or container.

SEE OR SEARCH THIS CLASS, SUBCLASS:

403+, for a device for emptying a portable receptacle.

811 Nongravity type:

This subclass is indented under subclass 810. Process of removing the contents of the receptacle or container by working against the weight of the contents (e.g., (a) by engaging and lifting the contents from the receptacle or container, or (b) by forcibly removing the contents from the receptacle or container).

SEE OR SEARCH THIS CLASS, SUBCLASS:

416.01 through 416.12, for a nongravity-type device for emptying a portable receptacle.

812 Of charging or discharging self-loading or unloading vehicle:

This subclass is indented under subclass 800. Process of (a) depositing or removing a load from a receiving portion of a vehicle by handling means carried by the vehicle or (b) transferring a load to a position for subsequent transfer into a receiving portion of a vehicle by handling means carried by the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
467+, for a self-loading or unloading vehicle.

813 With conveyor:
This subclass is indented under subclass 812. Process wherein the vehicle includes or carries an assemblage of elements for moving or advancing a load over a predetermined path or path section defined by the assemblage to load or unload the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
507+, for a self-loading or unloading vehicle including a conveyor.

814 Of loading or unloading elevator or hoist and including loading or unloading means therefor:
This subclass is indented under subclass 800. Process of loading or unloading a platform or lift which moves in a vertical or inclined path for raising or lowering a load on a load carrier in the form of a bucket, cage, car, grapple, hook, lifting fork, platform, etc., and means for facilitating in the loading or unloading of the carrier.

SEE OR SEARCH THIS CLASS, SUBCLASS:
592+, for an elevator or hoist and loading or unloading means therefor.

815 Including vertically swinging load support:
This subclass is indented under subclass 800. Process including a load carrier able to oscillate in a plane perpendicular to the horizon.

SEE OR SEARCH THIS CLASS, SUBCLASS:
680+, for a material or article handler having a vertically swinging load support.

816 Of reorienting article:
This subclass is indented under subclass 800. Process of displacing an article wherein the sole function of the displacement is for changing the disposition of the article.

SEE OR SEARCH THIS CLASS, SUBCLASS:
754+, for a device for reorienting an article.

CROSS-REFERENCE ART COLLECTIONS

900 Adjust to handle articles or groups of different sizes:
This subclass is indented under subclass 922. A collection of art in which at least one component of the apparatus changes its configuration to handle or accommodate articles or article assemblages of varying sizes.

901 Including article counter:
This subclass is indented under subclass 922. A collection of art including means for counting the number of articles placed in or removed from the assemblage.

902 Including control for pattern of group:
This subclass is indented under subclass 922. A collection of art including means which (a) determines, or is encoded with, the proper relative position that the articles should have within the assemblage and (b) directs the operation of at least one component of the apparatus to position the articles properly therein.

903 With article-supporting fluid cushion:
This subclass is indented under subclass 922. A collection of art in which either the apparatus or a supporting structure for the assemblage is provided with a fluid cushion upon which one or more articles are directly supported.

904 With means to apply adhesive to article:
This subclass is indented under subclass 922. A collection of art in combination with means which coats a portion of the article with an adhesive either during placement in or while in the assemblage.

905 Having geneva drive for apparatus:
This subclass is indented under subclass 922. A collection of art in which the apparatus for placing, adjusting, or removing the articles is driven through a transmission including two interengaging rotary members, one member having cam means symmetrically arranged about its axis of rotation and the other member having means offset from its axis of rotation, wherein the cam means and the offset means

cooperate to convert constant rotary motion input to intermittent rotary motion output.

906 With article flap deflector:
This subclass is indented under subclass 922. A collection of art combined with means which manipulates a closure flap of at least one carton- or box-type article in the assemblage.

907 Including means pressing against top or end of group:
This subclass is indented under subclass 922. A collection of art including means which pushes on the top or side of at least one article of the assemblage to compress several articles within the assemblage against each other.

908 PERFORATED ARTICLE HANDLING:
A means to handle a perforated article.

909 REMOTE CONTROL HANDLERS:
Article handling apparatus having a means located remotely from the apparatus and through which a control instruction is input to the apparatus.

910 HOLLOW CYLINDER HANDLERS:
Apparatus for handling articles having a hollow cylinder configuration.

911 ROLL HANDLERS:
Apparatus for handling articles which comprise a roll of material.

912 COMBINED OR CONVERTIBLE IMPLEMENTS:
Article handling apparatus combined with other art devices.

913 HANDLERS WITH SPRING DEVICES:
Apparatus for handling articles by means of a resilient device.

914 HANDLING VEHICLES WITH OVERHEAD GUARD FOR OPERATOR:
Apparatus for handling articles comprising a vehicle having means to accommodate a human operator therefor and a means protecting the operator against injury to the head by falling objects.

915 HANDLER-TYPE TOY:
Apparatus for handling articles which is of a size whereby it is considered to be a toy.

916 SHAFT MUCKING MACHINES:
Mechanisms for removing muck from shafts.

917 HANDLERS UTILIZING PARALLEL LINKS:
Apparatus for handling articles by means of a parallel link motion transmitting means.

918 TRANSMISSION-LINE GUIDE FOR A SHIFTABLE HANDLER:
An apparatus for handling articles which apparatus is movable from on place to another and wherein a transmission line is provided to guide the apparatus in its movement.

919 VEHICLE-CARRIED STORAGE MEMBER (E.G., PORTABLE SILO, ETC.) AND MEANS FOR ERECTING MEMBER FROM ATTITUDE DURING TRANSPORT TO POSITION OF INTENDED USE:
A means for storing articles or material in combination with a vehicle having means adapted to transport said storing means in one orientation, e.g., horizontally, and means to reorient said storing means at the location where it is to be used into an orientation in which it is to be used, e.g., vertical.

920 HANDLING DEVICE ON TRACTOR UNIT:
A vehicle of the farm tractor type having an article handling means operatively mounted thereon.

921 HANDICAPPED PERSON HANDLING:
Devices specifically intended to be used to manipulate handicapped persons from one place or position to another.

922 Associated with forming or dispersing groups of intersupporting articles (e.g., stacking patterns, etc.):
A collection of art disclosing useful details of apparatus, methods, or products not specifically provided for elsewhere in other subclasses of this class (414) which (a) are utilized in or during the placement, adjustment, or removal of articles to, within, or from an assemblage of contacting intersustaining articles (e.g., stack) or (b) show an interesting characteristic of an intersustaining article assemblage (e.g., stack shape).

923 Including support for group:
This subclass is indented under subclass 922. A collection of art including structure for supporting the article assemblage.

SEE OR SEARCH CLASS:
211, Supports: Racks, subclasses 49.1+ for a support for stacked articles, per se.
271, Sheet Feeding or Delivering, subclasses 207+ for a receiver for sheets.

924 Vertically shiftable:
This subclass is indented under subclass 923. A collection of art wherein the supporting structure is movable either upwardly or downwardly.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, subclasses 217+ for a lowering receiver for sheets.

925 Shifted by change in weight thereon:
This subclass is indented under subclass 924. A collection of art in which the upward or downward movement of the supporting structure is caused by a variation in the weight of the assemblage due to either the addition or removal of an article thereto or therefrom.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, subclass 219 for a sheet receiver with a spring-loaded support.

926 Shifted by article responsive means:
This subclass is indented under subclass 924. A collection of art in which the upward or downward movement of the supporting structure is caused by means responding to the placement or removal of an article to or from the assemblage.

927 Including means for supplying pallet or separator to group:
This subclass is indented under subclass 922. A collection of art including means which moves a detached portable platform from a source and places it on the site where the assemblage if formed or within the assemblage, the platform receiving the articles as they are placed in the assemblage and traveling therewith to facilitate the handling of the assemblage when it is moved as a unit from the site.

928 Recirculates emptied pallet or separator:
This subclass is indented under subclass 927. A collection of art wherein the means also returns the detached portable platform after the removal of the group therefrom to the site.

929 Including means for collecting emptied pallet or separator:
This subclass is indented under subclass 922. A collection of art including means which removes a detached portable platform either from a site where the assemblage is taken apart or from the assemblage after the articles of the assemblage supported thereon have been removed.

930 Manual step utilized:
This subclass is indented under subclass 922. A collection of art in which at least one operation utilized in or during the placement or removal of articles is done by hand.

931 Bricks:
This subclass is indented under subclass 922. A collection of art wherein at least two of the articles of the assemblage are bricks.

932 Audio or video cassettes:
This subclass is indented under subclass 922. A collection of art wherein at least two of the articles of the assemblage are audio or video cassettes.

933 Group formed or dispensed by reversible apparatus:
This subclass is indented under subclass 922. A collection of art in which the articles of the assemblage are removed therefrom by reversing the operation of the apparatus which had previously placed them therein.

934 Nonconforming article diverted:
This subclass is indented under subclass 922. A collection of art in which at least one operation or component of the apparatus takes an unacceptable or unwanted article either directly from the article assemblage, its supply of articles, or its discharge of articles.

935 ASSOCIATED WITH SEMICONDUCTOR WAFER HANDLING:
A collection of art disclosing useful subject matter utilized in the handling of flat, sheetlike semiconductor wafers.

936 Including wafer orienting means:
This subclass is indented under subclass 935. A collection of art including means the sole function of which is to move a wafer or group of wafers to effect a change in the orientation thereof (e.g., to align a wafer flat, etc.).

937 Including means for charging or discharging wafer cassette:
This subclass is indented under subclass 935. A collection of art including means used in charging or discharging a wafer into a portable rack having distinct supporting elements for plural wafers.

938 Wafers positioned vertically within cassette:
This subclass is indented under subclass 937. A collection of art wherein the wafer is placed into a rack which has its supporting elements arranged in a manner that maintains the planar surface of the wafer in a vertical attitude.

939 Including wafer charging or discharging means for vacuum chamber:
This subclass is indented under subclass 935. A collection of art including means for charging or discharging one or more wafers to or from areas having different pressures, one of which areas operates in a vacuum condition.

940 Wafer cassette transporting:
This subclass is indented under subclass 935. A collection of art for bodily moving a portable rack which has distinct elements for supporting plural wafers (e.g., furnace charging, etc.).

941 Includes means for gripping wafer:
This subclass is indented under subclass 935. A collection of art which includes means having seizing, grasping, or clamping structure for engaging the wafer during a handling operation.

FOREIGN ART COLLECTIONS

The definitions below correspond to abolished subclasses from which these collections were formed. See the Foreign Art Collection schedule of this class for specific correspondences. [Note: The titles and definitions for indented art collections include all the details of the one(s) that are hierarchically superior.]

FOR 100 PROCESSES:
Foreign art collection for apparatus claiming processes for handling articles.

FOR 101 APPARATUS FOR CHARGING A LOAD HOLDING OR SUPPORTING ELEMENT FROM A SOURCE, AND MEANS FOR TRANSPORTING THE ELEMENT TO A WORKING, TREATING, OR INSPECTING STATION (414/222):
Foreign art collection comprising means for charging a load-grasping device, load-securing (e.g., impaling, suction, etc.) structure, or load-underlying surface, from a source of material supply, and means to move the device, structure, or surface to, or translationally align it with, a nominal or unspecified work, treatment, or inspection station not classifiable elsewhere.

FOR 102 Supply source includes member capable of 360 degree revolution (414/223):
Foreign art collection wherein the supply source may rotate 360 degrees about a support axis.

FOR 103 Supply source includes a chute (414/224):
Foreign art collection wherein the supply source is an inclined flow path which conveys material to the charging position of the device, structure, or surface.

FOR 104 Load holding or supporting element includes gripping means (414/225):
Foreign art collection wherein the device, structure, or surface includes means to grip the load.

FOR 105 Including pivoted jaw (414/226):
Foreign art collection wherein the load-gripping means includes at least one pivotably mounted jaw.

FOR 106 MOVABLE RACK HAVING SUPERPOSED; CHARGE-SUPPORTING ELEMENTS, AND EXTERNAL MEANS FOR CHARGING OR DISCHARGING THE ELEMENTS (414/331):

Foreign art collection comprising a portable rack having superposed, interconnected load-supporting elements, and means supported externally thereof to place a load on or remove a load from an element.

FOR 107 Nongravity type:
Foreign art collection including emptying devices in which the means for removing the contents of the receptacle (a) engages and lifts the contents from the receptacle, or (b) forcibly removes it therefrom.

(1) Note. Grapple devices for removing individual articles from containers are not classified here unless they are designed for mutual cooperation with the receptacle or have combined therewith means for handling the receptacle.

FOR 108 Ejector:
Foreign art collection including devices in which the means for removing the contents of the receptacle is designed to apply a force behind the contents so as to push or eject them from the receptacle.

END